

# SECTION ONE INTRODUCTION

This draft environmental impact statement (EIS) evaluates the environmental effects that could occur if specific projects designed to reduce wildfire hazard and risk are implemented. The projects would consist of vegetation management work in 105 defined project areas. One hundred of these areas are in a region informally known as the East Bay Hills, and the remaining five areas are in Miller/Knox Regional Shoreline, a facility of the East Bay Regional Park District (EBRPD) on San Francisco Bay.

As used in this EIS, the term East Bay Hills refers to a series of ridges east of San Francisco Bay that begin on the east side of Interstate 80 in Richmond and run southeast to Lake Chabot. The East Bay Hills contain many densely built residential neighborhoods of mostly single-family homes but also include large tracts of open space and wildlands managed by EBRPD, the University of California, Berkeley (UCB), the City of Oakland (Oakland), and the East Bay Municipal Utilities District.

Vegetation management work in 60 of the 105 project areas was proposed in four grant applications submitted to the Department of Homeland Security's Federal Emergency Management Agency (FEMA) by EBRPD, UCB, and Oakland. The four applications are described in Section 1.1 below. In addition to the vegetation management work proposed for grant funding, there is additional work proposed within the project areas that may be funded by other agencies. Some of this additional work includes activities that are not eligible for FEMA funding, such as the pile burning and area burning proposed by EBRPD. In this EIS, the combination of vegetation management activities proposed for FEMA funding (the grant applications) and the activities proposed to be funded by others on the 60 project areas is identified as the proposed action.

The remaining 45 project areas are adjacent or nearby areas in which EBRPD plans to do similar vegetation management work. This EIS refers to these 45 additional areas as connected project areas. Vegetation management work in the 45 connected project areas is needed to reduce wildfire hazard in additional areas. Together, the proposed and connected actions would provide more effective protection over a larger area by creating a continuous firebreak along the most vulnerable urban-wildland interfaces. Both the proposed and connected actions would need to be completed in order to achieve substantial reductions in hazardous fire risk.

EBRPD's 48 proposed and 45 connected project areas are among the vegetation management areas identified in EBRPD's Wildfire Hazard Reduction and Resource Management Plan (EBRPD 2009b). The proposed vegetation management work in the 48 proposed project areas included in the grant application is intended to reduce fire hazard in areas that are particularly vulnerable to wildfire or are particularly in need of protection.

The proposed action would be implemented on land owned by UCB and Oakland and within 11 parks owned and maintained by EBRPD. The connected actions would occur in seven of the 11 parks. Figure 1-1 shows the proposed and connected project areas in the context of the larger surrounding area. EBRPD's proposed projects and all of the connected actions are elements of EBRPD's 10-year plan for wildfire hazard reduction. The connected actions are being implemented as funding becomes available.

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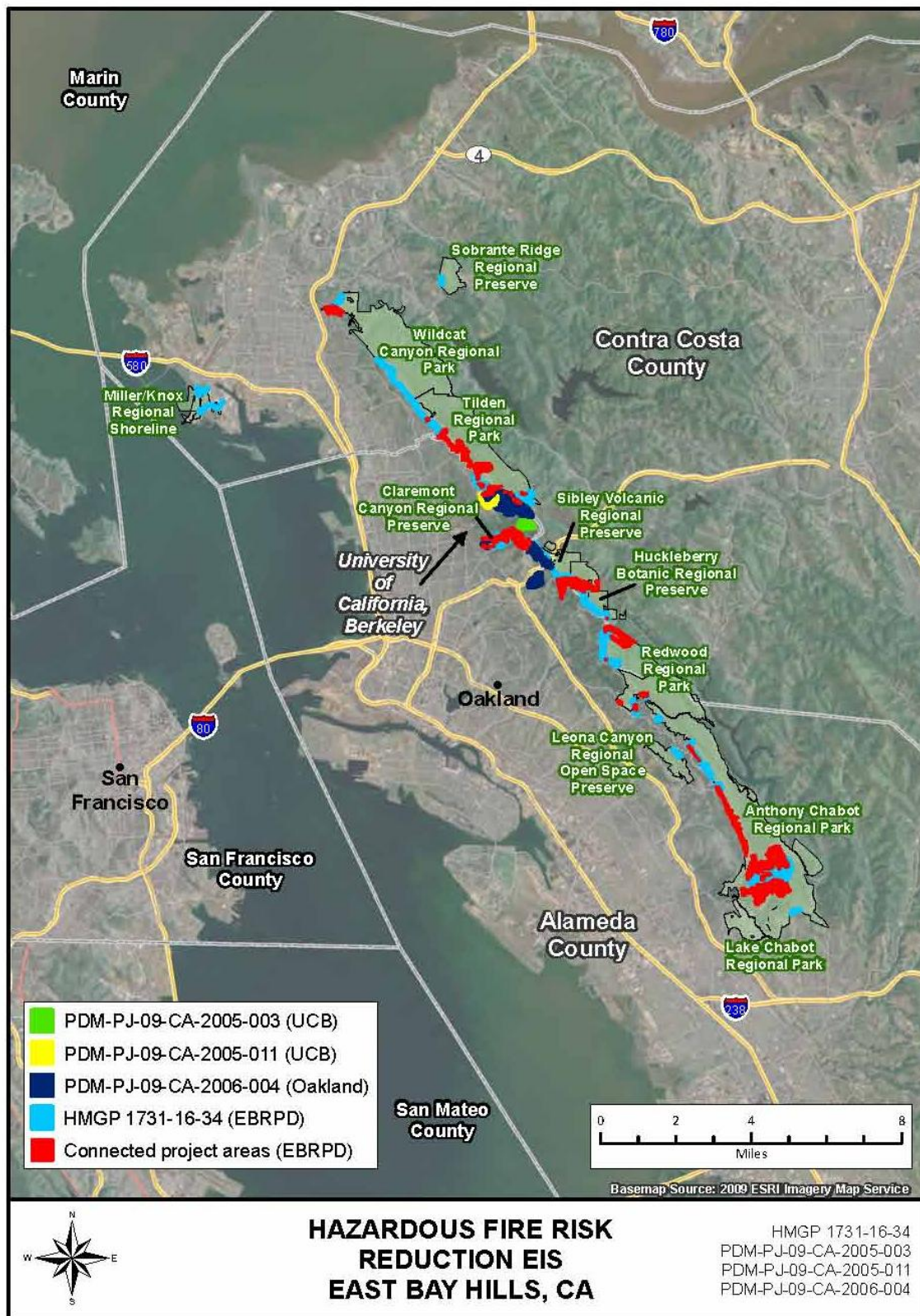


Figure 1-1. Proposed and Connected Project Areas

This section of the EIS describes the grant applications, a previous environmental assessment on a portion of the proposed project area, the lead and cooperating agencies, the statutory and regulatory framework for the EIS, the scope of the EIS, the public involvement process, and guidance on how to interpret references to sources of information in the text of the EIS.

## 1.1 The Grant Applications

UCB, Oakland, and EBRPD have submitted a total of four grant applications to FEMA through the California Emergency Management Agency (Cal EMA) for federal financial assistance to implement hazardous fire risk reduction projects in the East Bay Hills of Alameda and Contra Costa counties, California and at the Miller/Knox Regional Shoreline in Contra Costa County. Cal EMA is the official applicant, and UCB, Oakland, and EBRPD are subapplicants.

Table 1-1 lists the subapplicants, application numbers, and acreage for the proposed hazardous fire risk reduction projects. The proposed and connected actions are described in detail in Section 3.

**Table 1-1. Subapplicants, Application Numbers, and Acreage for the Proposed Hazardous Fire Risk Reduction Projects (Proposed Action)**

Subapplicant	Application Number	Acreage <sup>(1)</sup>
UCB	Strawberry Canyon PDM-PJ-09-CA-2005-011	56.3
	Claremont Canyon PDM-PJ-09-CA-2005-003	42.8
Oakland	PDM-PJ-09-CA-2006-004	359.0
EBRPD	HMGP 1731-16-34	540.2
<b>Total</b>		<b>998.3</b>

<sup>(1)</sup> Acreages were identified using information by the subapplicants and geographic information system (GIS) software.

CA = California

EBRPD = East Bay Regional Park District

HMGP = Hazard Mitigation Grant Program

Oakland = City of Oakland

PDM = Pre-Disaster Mitigation

PJ = Project

UCB = University of California, Berkeley

### 1.1.1 UCB

UCB submitted two grant applications under FEMA's Pre-Disaster Mitigation (PDM) program: one for a 56.3-acre area designated Strawberry Canyon-PDM in this EIS and one for a 42.8-acre area designated Claremont-PDM. To reduce the potential for these areas to support and spread wildfires, UCB proposes to eliminate eucalyptus, Monterey pine, and other non-native trees that promote the spread of wildfire. Oak and bay trees and other native vegetation present under the larger non-native trees would be preserved and encouraged to expand. UCB would take this same general approach in the proposed Frowning Ridge-PDM project, which is included in Oakland's grant application (see Section 1.1.2 below).

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### **1.1.2 Oakland**

Oakland submitted an application under the Pre-Disaster Mitigation program for six projects in Alameda County near the Contra Costa County border on property owned by Oakland, UCB, and EBRPD. The projects are Oakland's North Hills-Skyline-PDM and Caldecott Tunnel-PDM projects; UCB's Frowning Ridge-PDM project; and EBRPD's Tilden Regional Park-PDM (Tilden-Grizzly) project, Sibley Volcanic Regional Preserve-PDM (Sibley Triangle and Island) project, and Claremont Canyon-PDM (Claremont Canyon-Stonewall) project. These six project areas total 359.0 acres. In its North Hills-Skyline and Caldecott Tunnel projects, Oakland would seek to eliminate eucalyptus and other non-native, fire-promoting trees; preserve native trees and give them room to grow; and create a fuel break on the west side of Grizzly Peak Boulevard north and east of the Caldecott Tunnel.

### **1.1.3 EBRPD**

EBRPD submitted an application under FEMA's Hazard Mitigation Grant Program (HMGP) for reduction of fuel loads on 540.2 acres in 11 regional parks: Anthony Chabot Regional Park, Claremont Canyon Regional Preserve, Huckleberry Botanic Regional Preserve, Lake Chabot Regional Park, Leona Canyon Regional Open Space Preserve, Miller/Knox Regional Shoreline, Redwood Regional Park, Sibley Volcanic Regional Preserve, Sobrante Ridge Regional Preserve, Tilden Regional Park, and Wildcat Canyon Regional Park. EBRPD would reduce fuel loads primarily by promoting conversion of dense scrub, eucalyptus forest, and non-native pine forest to grassland with islands of shrubs. Oak and bay trees would be preserved. EBRPD would take this same general approach in the three proposed EBRPD projects included in the City of Oakland's grant application (see Section 1.1.2 above).

## **1.2 Previous Environmental Assessment Related to the EIS**

In January 2008, FEMA published a Notice of Availability for a Draft Environmental Assessment (EA) on the Strawberry Canyon project area for public comment (FEMA 2007). That EA addressed the Strawberry Canyon-PDM vegetation management project as proposed in UCB's grant application PDM-PJ-09-CA-2005-011. The public involvement process revealed concerns regarding the effectiveness and scope of the proposed vegetation removal methods, the proposed application of wood chips in portions of the project area, impacts to plant and animal species in the project area, and potential cumulative impacts of all projects in the project area.

Based on the findings of that EA, FEMA determined that an EIS should be prepared to address the potential environmental impacts of the proposed Strawberry Canyon vegetation management project as well as the vegetation management projects proposed in UCB's other grant application and the grant applications submitted by Oakland and EBRPD. Pursuant to that determination, FEMA prepared this EIS.



### 1.3 Lead and Cooperating Agencies

FEMA is the lead federal agency for preparation of this EIS. Other local, state, and federal agencies may be involved in the EIS process because they have special expertise in or knowledge of environmental issues, they have jurisdiction by law, or they must approve a portion of the proposed action.

FEMA has invited the U.S. Forest Service (USFS), the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), Cal EMA, UCB, Oakland, and EBRPD to be cooperating agencies, and all have accepted. FEMA and the cooperating agencies have executed a memorandum of understanding to govern their working relationship for preparation of this EIS. The memorandum of understanding is in Appendix J.

USFWS has special expertise with respect to threatened and endangered species and has legal jurisdiction over portions of the proposed and connected actions that could affect threatened and endangered species. USFWS is helping FEMA meet its responsibility to comply with Section 7 of the Endangered Species Act and to do so in a timely manner.

NPS and USFS have special expertise with respect to hazardous fire risk reduction, fire behavior, fire ecology, forest ecology, and other issues related to the proposed and connected actions. As a cooperating agency, USFS provided advice for FEMA's consideration in analyzing the potential impacts of herbicides on human health and the environment.

Cal EMA is the applicant for FEMA funding under the PDM program and the HMGP. UCB, EBRPD, and Oakland are subapplicants and would use the grant funds to implement the proposed action. Cal EMA has administrative responsibilities under both grant programs and has special expertise with respect to hazard mitigation program issues.

UCB, EBRPD, and Oakland have legal jurisdiction over portions of the proposed and connected project areas and have special expertise with respect to certain environmental and hazard mitigation issues related to the proposed action. EBRPD has technical expertise regarding fire behavior and fire ecology.

### 1.4 Statutory and Regulatory Framework

#### 1.4.1 FEMA Hazard Mitigation Funding Programs

The funding sought in the four grant applications would be provided under the PDM program and the HMGP. The PDM program is authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act, 42 U.S. Code [U.S.C.] § 5133), and the HMGP is authorized by Section 404 of the Stafford Act (42 U.S.C. § 5170c).

FEMA funding of hazardous fire risk reduction projects is addressed in FEMA Mitigation Policy MRR-2-08-1, *Wildfire Mitigation Policy for the Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program* (FEMA 2008). However, the specific requirements and eligibility criteria of the mitigation policy apply only to projects for which the grant application period was open on or after September 8, 2008. Therefore, this policy applies only to the EBRPD HMGP

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grant application (HMGP DR-1731-16-34). All four applications are subject to the more general FEMA policies applicable to the PDM program and the HMGP.

### 1.4.2 Environmental Review Requirements

FEMA's involvement in the hazardous fire risk reduction projects triggers the requirements of the National Environmental Policy Act (NEPA; 42 U.S.C. §§ 4321–4327), which include an evaluation by federal agencies of the potential environmental impacts of proposed actions and a consideration of the impacts during the decision-making process. FEMA is preparing this EIS in accordance with the Council on Environmental Quality's (CEQ's) NEPA implementing regulations in Title 40 Code of Federal Regulations (CFR) Parts 1500 through 1508 and FEMA's NEPA procedures in 44 CFR Part 10.

## 1.5 Scope of this EIS

FEMA has determined that all proposed vegetation management work in the 60 project areas included in the four grant applications should be assessed in the same EIS. This determination is based on the proximity of the project areas to each other and the potential for cumulative impacts (see 40 CFR § 1508.25). In this EIS, the work proposed in those 60 areas is called the proposed action. FEMA has concluded that the proposed action and additional hazardous fire risk reduction projects planned by EBRPD are interdependent parts of an overall hazardous fire risk reduction program designed to create a fuel break at the interface between the developed and undeveloped portions of the East Bay Hills. The additional projects planned by EBRPD are connected to the proposed action and are therefore addressed in this EIS.

Selection of topics to be addressed in the EIS was based on concerns raised during public scoping (see Section 1.6) and on regulatory and FEMA policy requirements. These issues involve resources that could be beneficially or adversely affected by the proposed action. Impact topics include:

- Biological resources
- Fire and fuels
- Geology, seismicity, and soils
- Water resources
- Air quality
- Climate and microclimate
- Historic properties
- Aesthetics and visual quality
- Socioeconomics
- Human health and safety
- Public services, infrastructure, and recreation
- Land use and planning
- Transportation
- Noise

### 1.6 Public Involvement

Public involvement is an important part of the NEPA process. The success of NEPA as an environmental disclosure and problem-solving law is based on open decision making. NEPA provides opportunities for public involvement at several steps in the environmental review process, including public scoping and public review of a draft EIS.

The public scoping process required by 40 CFR § 1501.7 was completed for the proposed action. A notice of intent to prepare an EIS for the proposed action was published in the *Federal Register* on June 10, 2010. The notice of intent stated that approximately 980 acres would be affected. After the scoping process was complete, the number of acres included in the proposed Frowning Ridge-PDM project was increased and other proposed project areas were reduced or eliminated. As shown in Table 1-1, the proposed action addressed in this EIS involves a total of 998.3 acres. After scoping, FEMA determined that the EIS must also address the connected actions. The connected actions addressed in this EIS involve a total of approximately 1,060.7 acres. Therefore, the total amount of land involved in the actions addressed in this EIS is approximately 2,059.0 acres.

The notice of intent initiated a public scoping period that concluded on October 1, 2010. The public scoping period was the primary opportunity for public involvement in the EIS process to date. Scoping allows the public, interested parties, and government agencies to identify issues and concerns to be addressed in the EIS. FEMA conducted public scoping meetings in two sessions on August 26, 2010, at the EBRPD Skyline Center. The scoping meetings solicited input from the public, local businesses, associations, affected government agencies, and other interested parties about the environmental topics to be included in the EIS and the issues to be analyzed in depth.

A total of 113 comments (105 distinct comments) were received by mail, email, comment card, fax, oral comment, and the *Federal Register* website. The issues and concerns identified during scoping and in earlier public comments ranged from fire hazard and behavior to air quality and herbicide use to aesthetics. These issues and concerns provided the basis for selection of the topics addressed in detail in Section 5, the Environmental Consequences section of this EIS. Public scoping comments regarding alternatives to the proposed action are addressed in Section 3.3.

The areas of concern and the types of comments received during scoping are listed in Table 1-2. A more detailed description is provided in the Scoping Report in Appendix K. Section 7 provides a detailed description of the EIS public outreach and involvement process and its results.

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**Table 1-2. Summary of Comments Received During the EIS Scoping Process**

Area of Concern	Types of Comments Received
Fire Hazard and Risk	Fire behavior, fire models, fuels, fire hazards, and relative fire risks
Herbicides	Impacts to people and the environment
Biology	Impacts to plants and wildlife; impacts to protected species and their habitat
Aesthetics	Visual resources and general enjoyment of the affected areas
Air Quality	Emissions from heavy equipment and burning of woody debris, degrading local air quality
Climate Change	Effect of tree removal and emissions on global warming
Microclimate	Local changes to wind, humidity, fog drip, and temperature
Invasive Species	Spread of invasive species, damage to native plant species, succession competition
Soil Erosion	Soil disturbance resulting in soil erosion, mudslides, and landslides
Water Resources	Soil disturbance resulting in soil erosion, increased sedimentation in nearby water bodies, and increased water turbidity. Deposits of sediments increasing the occurrence or severity of localized flooding and causing changes in surface hydrology

### 1.7 Source References

In this EIS, many statements are followed by a name or abbreviation and a year in parentheses, such as (EPA 2009). These are references to the sources of the information in the statements that precede them. They can be used to locate the full source references in Section 9.

## **SECTION TWO PURPOSE AND NEED FOR ACTION**

This section describes the purpose and need that FEMA is responding to and which forms a basis against which to evaluate proposed alternatives.

### **2.1 Purpose and Need**

The purpose of the project is to substantially reduce hazardous fire risk to people and structures in the East Bay Hills and the vicinity of Miller/Knox Regional Shoreline. Reduction of hazardous fire risk would reduce the need for future disaster relief and the risk of repetitive suffering and damage.

The four grant applications addressed in this EIS were submitted under FEMA's Pre-Disaster Mitigation (PDM) program and FEMA's Hazard Mitigation Grant Program (HMGP). The PDM program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and implementation of mitigation projects to prepare for a disaster. Funding these plans and projects reduces overall risks to people and structures while reducing reliance on funding connected with disaster declarations.

The HMGP provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce loss of life and property due to natural disasters and to enable implementation of mitigation measures during recovery from a disaster.

FEMA approval of the grant applications submitted to the California Emergency Management Agency (Cal EMA) by the subapplicants under the PDM program and the HMGP would serve the project purpose.

The need for the project arises from the severity and repetitive nature of wildfires in the East Bay Hills area and the proximity of residential areas to open spaces that are susceptible to fires. Fire hazard severity mapping prepared by the California Department of Forestry and Fire Protection (Cal Fire) indicates that most of the undeveloped areas in the East Bay Hills are in the very high fire hazard severity zone – the zone where wildfire hazard is most severe (Cal Fire 2007a, 2007b, 2008, 2009b). Several factors contribute to this very high fire hazard. The East Bay Hills and the vicinity of Miller/Knox Regional Shoreline have hot and dry fall seasons, wind-conductive topography, flammable vegetation, dense development, and limited accessibility for firefighting. The East Bay Hills are subject to hot, dry winds from the northeast that can drive a wildfire from the regional parks and other open space areas into residential areas. Miller/Knox Regional Shoreline is subject to winds from San Francisco Bay that can drive a wildfire into residential areas adjacent to the park.

The Hills Emergency Forum (HEF), which consists of nine local, state, and federal Bay Area fire protection and land management partners, has catalogued the large-fire history of the East Bay Hills based on newspaper accounts and local knowledge (HEF 2010). Between 1923 and 1992, 15 major wildfires occurred in the East Bay Hills. Eight were driven by east winds, known locally as Diablo winds, and seven were driven by west and southwest winds. The 15 fires



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burned a total of almost 9,000 acres, destroyed approximately 4,000 homes, and killed 26 people. One of the fires, the 1923 Berkeley Fire, destroyed more than 550 homes in a few hours. A fire in 1970 consumed more than 200 acres and burned 37 homes. The 1991 Tunnel Fire killed 25 people, destroyed more than 3,000 homes, and did an estimated \$1.5 billion in damage (California Office of Emergency Services 1992). At the time, the 1991 Tunnel Fire was ranked as “the greatest modern-era loss of life and property on record for North American urban-interface fires” (Sapsis et al. 1994). In 2009, the Tunnel Fire still ranked as California’s largest wildfire based on the number of structures destroyed, and the 1923 Berkeley Fire ranked ninth (Cal Fire 2009a).

In these historic fires, wind driven flames, embers, and superheated air and large quantities of highly flammable vegetation and vegetative fuels were significant factors in the loss of life and property. Steep topography and narrow evacuation routes that are liable to becoming overwhelmed by flames also add to the difficulty of fighting fires in this area.

All of the proposed project areas in the application submitted by the City of Oakland and the two applications submitted by UCB are in areas mapped by Cal Fire as very high fire hazard severity zones (Cal Fire 2008). Of EBRPD’s 48 proposed project areas, 39 and part of a 40<sup>th</sup> are in very high fire hazard severity zones (Cal Fire 2007a, 2007b, 2008, 2009b). Of EBRPD’s 45 connected project areas, 42 and part of a 43<sup>rd</sup> are in very high fire hazard severity zones. EBRPD selected its proposed and connected project areas based on multiple factors, including the following (EBRPD 2009b):

- Degree of fire hazard
- Proximity to facilities requiring defensible space
- Need to provide firefighter safety zones and to protect areas critical for firefighting operations
- Need to maintain areas where fuel reduction has been performed previously

Based on the wildfire hazard characteristics of the East Bay Hills and the Miller/Knox Regional Shoreline, FEMA has concluded that a need exists to reduce hazardous fire risk to people and structures in these areas. FEMA proposes to address this need by providing financial assistance to the subapplicants through the PDM program and the HMGP for long-term, cost-effective fuel reduction measures to reduce risk of loss of life and damage to vulnerable structures from wildfire.

## 2.2 Criteria for Alternatives to Meet the Purpose and Need

The PDM program and the HMGP are among FEMA’s Hazard Mitigation Assistance (HMA) grant programs. FEMA has determined that a proposed action must meet the criteria listed below to be eligible for funding under HMA programs (FEMA 2005, 2006d, 2008). Alternatives to a proposed action must also meet these criteria to be eligible for funding. To be eligible for funding, the proposed action or alternative must:

1. Be technically feasible and implementable
2. Solve a problem independently, consistent with 44 CFR § 206.434(c)(4)

3. Be cost effective and able to substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster, consistent with 44 CFR § 206.434(c)(5) and related guidance
4. Have a benefit-cost analysis using a FEMA-approved methodology that results in a benefit-cost ratio of 1.0 or greater
5. Provide for long-term effectiveness and benefits (between 5 and 10 years, depending on the type of action)
6. Be consistent with the goals and objectives identified in the current FEMA-approved state mitigation plan and local mitigation plan for the jurisdiction in which the action would occur
7. Conform to 44 CFR parts 9 and 10 and with all applicable environmental and historic preservation laws, implementing regulations, and executive orders, including the National Environmental Policy Act (42 U.S.C. §§ 4321-4347), National Historic Preservation Act of 1966 (16 U.S.C. §§ 470 et seq. ), Endangered Species Act (16 U.S.C. §§ 1531-1544), Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), and Executive Order 12898 (Environmental Justice)
8. Not duplicate benefits available from another federal source for the same purpose or assistance that another federal agency or program has the primary authority to provide
9. Be located in a community that is participating in the National Flood Insurance Program (NFIP) and is not on probation, suspended, or withdrawn from the NFIP if the community has been identified as having a Special Flood Hazard Area (SFHA) through the NFIP (i.e., a Flood Hazard Base Map or Flood Insurance Rate Map has been issued to the entity); there is no NFIP participation requirement for HMGP and PDM program project applications for projects located outside an SFHA
10. Meet the requirements of applicable local, tribal, state, and federal laws; implementing regulations; and executive orders

Consideration of alternatives under NEPA is not limited to alternatives that meet the funding agency's criteria for funding. The EIS must consider alternatives FEMA would not be able to fund. Alternatives FEMA could not fund should still meet all of the criteria listed above except 4, 8, and 9. Criteria 1, 2, 3, 5, 6, 7, and 10 were used in selecting alternatives for detailed study (see Sections 3.3 and 3.4). Criterion 3 – cost effectiveness and ability to substantially reduce risk – was particularly important in screening alternatives.

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### **SECTION THREE ALTERNATIVES INCLUDING THE PROPOSED AND CONNECTED ACTIONS**

Identifying and analyzing alternatives is an essential part of the NEPA decision-making process. As part of the alternatives analysis, preliminary alternatives are identified. These alternatives are then screened against the project purpose and need and other criteria. Some alternatives are eliminated from further consideration, and the remaining alternatives are carried forward for additional study.

#### **3.1 Preliminary Alternatives**

On June 10, 2010, FEMA published a notice of intent to prepare an EIS in the *Federal Register* (Appendix A). As part of the supplemental information in the notice of intent, FEMA used the following language to describe the preliminary alternatives.

FEMA considered five preliminary alternatives:

1. The proposed action
2. No action, which involves denying the grant applications
3. Funding the grant applications with conditions to address their environmental impacts
4. Funding the grant applications with fuel reduction methodologies that are different than as proposed by the applicants
5. Partially funding the grant applications, including funding some grant projects and denying others (*Federal Register 2010*)

#### **3.2 Changes to the Original EBRPD Grant Application**

The EBRPD modified its part of the proposed action by revising its original Hazard Mitigation Grant Program (HMGP) grant application (HMGP 1731-16-34). EBRPD reduced the number of acres listed in the grant from 590 acres to 540.2 acres. A 28.1-acre area in Lake Chabot Regional Park designated LC009 was removed from the grant because it is now in full maintenance mode, using goats to graze the grass and the remaining shrubs. In addition, the size of proposed project area AC003 in Anthony Chabot Regional Park was reduced by 15 acres. After the original grant application was submitted, EBRPD completed its Wildfire Hazard Reduction and Resource Management Plan and associated California Environmental Quality Act (CEQA) environmental impact report (EIR). Two portions of project area AC003, labeled “AC003-extension,” were not included in the Wildfire Hazard Reduction and Resource Management Plan and the EIR. EBRPD chose to reduce project area AC003 to the area assessed in the EIR. EBRPD also removed an area in Claremont Canyon Regional Preserve from its application.

## **Alternatives Including the Proposed and Connected Actions**

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### **3.3 Alternatives Considered But Eliminated From Further Study**

NEPA requires federal agencies to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR § 1502.14). All five preliminary alternatives were assessed against the criteria for meeting the identified purpose and need and against the comments received during scoping. FEMA determined that the alternative *Funding the Grant Applications with Conditions to Address Their Environmental Impacts* was actually the proposed action as it would evolve through the EIS process. Therefore, this alternative was dismissed as a separate alternative. The alternative *Partially Funding the Grant Applications, Including Funding Some Grant Projects and Denying Others* was determined to not be a separate alternative but a decision that FEMA could choose to make based on the findings of the EIS process. Therefore, it was also eliminated as a separate alternative.

The preliminary alternative *Funding the Grant Applications With Fuel Reduction Methodologies That Are Different Than as Proposed by the Applicants* was eliminated because none of the different methodologies that were significantly different from the proposed and connected actions appeared likely to meet the purpose and need described in Section 2. FEMA can still require modification of the proposed and connected actions as a condition of funding the grant applications. Members of the public, organizations, and government agencies can recommend modifications of the proposed and connected actions in comments on the draft EIS. Any modifications required by FEMA would be included in FEMA's record of decision on the proposed and connected actions.

Public comments received during the public scoping period in response to the proposed action suggested alternative methods for achieving the purpose and need. These alternative methods included both a comprehensive alternative program and additional specific measures. Another specific alternative method FEMA considered was broadcast burning. These alternatives and alternative measures are discussed in Sections 3.3.1 through 3.3.3.

#### **3.3.1 Alternative Hazardous Fuel Reduction Program Considered But Not Carried Forward for Additional Study**

Taken as a whole, a substantial group of public scoping comments suggested the following measures as part of an alternative approach to hazardous fuel reduction:

- Removal of brush and surface fuels
- Removal of lower tree limbs
- In areas where trees are thick, species-neutral removal of small trees and in some cases understory trees to remove ladder fuels and to create space between trees while maintaining shade to suppress growth of shrubs and grass
- Removal of eucalyptus debris that falls off the trees after a freeze
- Keeping grass short by mowing or grazing, especially along roads



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The elements of this alternative program are discussed in Sections 3.3.1.1 through 3.3.1.3, followed by an evaluation of the program as a whole in Section 3.3.1.4.

### **3.3.1.1 Removal of Brush, Surface Fuels, Lower Limbs, and Small Trees**

Removal of brush; removal of surface fuels, such as pine needles, eucalyptus bark, and fallen branches; and removal of lower tree limbs are effective elements of a hazardous fire risk reduction program and would be performed in many of the project areas under the proposed and connected actions.

Removal of small trees would leave tall trees in place, and most of the tall trees in the East Bay Hills are eucalyptus and Monterey pine. When vegetation burns, flaming objects break off and are carried upward on heat currents. The flaming objects are called embers or firebrands. Burning strips of eucalyptus bark are particularly likely to become firebrands. When an entire eucalyptus or Monterey pine tree catches fire, a phenomenon called torching or crowning, the tree releases firebrands at greater elevation. In the initial downwind spread of the 1991 Oakland Tunnel Fire, Monterey pines were the primary source of firebrands (Trelles and Pagni 1997). Eucalyptus firebrands can start new fires more than half a mile away (Gould et al. 2007). The taller the tree, the farther the firebrands are likely to travel.

Torching can be greatly reduced by removing surface fuels and “ladder fuels,” which include lower limbs, smaller trees, hanging strips of eucalyptus bark, and shrubs that can carry a fire up into the treetops (the crown or canopy). Smaller trees and shrubs are often called “understory” vegetation. Understory vegetation keeps growing back, and in a eucalyptus forest the understory vegetation tends to be draped with strips of flammable eucalyptus bark. Surface debris builds up rapidly in eucalyptus stands in the East Bay Hills (Agee et al. 1973). Repeated removal of ladder fuels is expensive and can be difficult on the steep slopes so common in the proposed and connected project areas. In addition, continuous regular maintenance on steep slopes can destabilize soils and lead to erosion.

### **3.3.1.2 Removal of Eucalyptus Debris After a Freeze**

Prolonged freezing weather rarely kills a eucalyptus tree, but all or part of the aboveground portion of the tree often dies in a prolonged freeze. The dead parts fall off and provide large amounts of fuel for a wildfire. A freeze in December 1990 contributed to the severity of the October 1991 Oakland Tunnel Fire (Santos 1997, FEMA 1991). The fire hazard represented by eucalyptus trees can be reduced by removing or chipping the dead material after a freeze. This is a major undertaking, however, and because it is not done regularly, the personnel, equipment, and funds required to do it quickly are not likely to be available. Cutting and removing or chipping eucalyptus trees avoids the fire hazard a freeze creates.

### **3.3.1.3 Keeping Grass Short**

Keeping grass short by mowing or grazing, especially along roads, is a basic element of an effective wildfire hazard reduction program. Many wildfires have begun in grass. The 1991 Oakland Tunnel Fire began in an area that was mostly grass, with some brush and a few trees (FEMA 1991). Grass was not the fuel that made the fire so destructive, however. It was fed mainly by trees, brush, and houses.

## **Alternatives Including the Proposed and Connected Actions**

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Both the proposed and connected actions and the no action alternative include maintenance of grass by mowing or grazing. The proposed and connected actions would reduce the amount of forest and brush in the project areas, thereby increasing the amount of grassland and making maintenance of grassland more important. Under current conditions, however, many residential areas are adjacent to forest and scrub. Maintenance of grassland is not a substitute for reducing the amount of hazardous fuel in the forest and scrub.

### **3.3.1.4 Combined Alternative Program**

The alternative hazardous fuel reduction program outlined at the beginning of this Section 3.3.1 has two fundamental weaknesses, as illustrated by the discussions of its components in Sections 3.3.1.1 through 3.3.1.3. First, its species-neutral approach does not adequately address the special characteristics of eucalyptus and Monterey pine trees that can make wildfires difficult or even impossible to control (see Section 3.3.1.1). Second, its reliance on continuous removal of ladder fuels under tall trees on steep slopes would likely be prohibitively expensive and increase erosion by disturbing soils. For these reasons, this alternative fuel reduction program would not meet the purpose and need and was eliminated from further study.

### **3.3.2 Broadcast Burning**

Broadcast burning is a type of prescribed burning in which fire is applied generally to most or all of a defined area. Broadcast burning is best suited to reduction of debris and vegetation near the ground. Eucalyptus and Monterey pine trees are major contributors to wildfires in the East Bay Hills and grow to more than 100 feet in height. Although eucalyptus is highly flammable, it is seldom killed by fire (Esser 1993). After a fire consumes the flammable surface litter eucalyptus trees generate, the trees produce more litter. Frequent broadcast burns would be necessary to maintain the benefit of the first burn. Attempting to consume entire eucalyptus trees by burning is hazardous because of the strong tendency of eucalyptus to throw off burning strips of bark that can start fires downwind. Eucalyptus trees produce heat-resistant seed capsules, and live seeds lie dormant in soil for extended periods (Esser 1993). Fire increases release of seeds from eucalyptus trees. Increased sunlight after a fire activates the seeds, and the seedlings grow rapidly. Fire helps eucalyptus compete with other plant species.

Monterey pine cones open and release seeds in a fire. By burning away surface litter, fires increase the likelihood that the seeds would germinate. The reproduction rate of Monterey pine is greatest after a surface fire if adult trees survive (Cope 1993). Management of a broadcast burn intense enough to kill adult Monterey pines is challenging, especially near homes and other structures.

For these reasons, broadcast burning alone would not meet the purpose and need and was eliminated from further study. EBRPD would use broadcast burning in certain areas under certain conditions as part of the proposed and connected actions.

### **3.3.3 Additional Specific Wildfire Hazard Reduction Measures Considered But Eliminated From Further Study**

The following additional specific wildfire hazard reduction methods suggested in public scoping comments were considered but eliminated from further study:

## **Alternatives Including the Proposed and Connected Actions**

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- Creation of defensible space around structures
- Improvement of firefighting capacity, equipment, and tactics
- Exterior sprinkler systems
- Roof replacement
- Management of resprouts from stumps without using herbicides (manual removal, covering stumps with opaque plastic sheeting, coating stumps with natural tar)

These measures are not full alternatives to the proposed and connected actions, but were proposed for consideration in public comments submitted during the scoping process. They are discussed in the subsections that follow.

### **3.3.3.1 Creation of Defensible Space Around Structures**

Creation of defensible space around structures is an important element of a wildfire hazard reduction program. For individual homes in California, defensible space is generally understood to mean removal of most vegetation within 30 feet of the home and thinning and pruning vegetation between 30 and 100 feet from the home. California law requires establishment and maintenance of 100 feet of defensible space around most occupied structures in the East Bay Hills (California Government Code § 51182, California Public Resources Code § 4291). The area in which vegetation is reduced is called defensible space because it is a space from which firefighters can defend the home from a wildfire.

Creation of defensible space around structures reduces the likelihood that the structures would burn in a wildfire but has two major limitations as a wildfire mitigation program. First, it depends on active and continuing participation by thousands of people. Many property owners do not comply with the existing defensible space requirements, and enforcement of the requirements may not be a top priority of state and local government. Enforcement is likely to be weak or ineffective in hard economic times when government has less money for enforcement and property owners have less money for compliance.

The second major limitation of defensible space as a wildfire mitigation program is that it does not address the large amounts of vegetative fuel in undeveloped areas. A strong wind can blow the superheated gases generated by a wildland fire into developed areas (FEMA 1991). This can preheat structures hundreds of feet from the fire to the point where they readily ignite when a firebrand is blown up against them. The superheated gases can raise combustible structural materials to the temperature at which they ignite in the absence of a flame (FEMA 1991). Even in the absence of superheated gases, firebrands can ignite structures well ahead of the flame front. If an intense wildland fire driven by Diablo winds reaches the edge of a residential neighborhood, 100 feet of defensible space would not be enough to protect many of the homes.

Because of the two major limitations described above, creation of defensible space around structures would not meet the purpose and need and was eliminated from further study.

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### **3.3.3.2 Improvement of Firefighting Capacity, Equipment, and Tactics**

As demonstrated by the 1991 Oakland Tunnel Fire, a wildfire in the East Bay Hills can quickly become too large and intense to be contained by firefighters. The Tunnel Fire could not be controlled until the Diablo wind ceased and was replaced by a cool damp ocean breeze (FEMA 1991).

Firefighting capacity has improved significantly since the 1991 fire. Blonski, Miller, and Rice (2011) reported the following improvements in the 20 years since the fire:

- All fire hydrants in the City of Oakland (Oakland) were retrofitted with 2.5-inch national standard thread connections, making it easier for outside firefighters to connect their equipment.
- The East Bay Municipal Utilities District (EBMUD) worked with local cities to improve water supply and increase flow to fire hydrants.
- Specifically, water supply was improved in Oakland's Rockridge district, which was badly damaged in the 1991 fire.
- EBMUD acquired portable pumps for emergency use, connected all pumping plants to emergency generators, and installed emergency generators in some pumping plants.
- Systems for communication among organizations involved in firefighting were improved.

Additional improvements could be made, but firefighting improvements would not be sufficient to control and extinguish a wildfire of the size and intensity that could occur in the East Bay Hills under existing conditions. A fire could expand rapidly in multiple directions, stretching firefighters thin along a longer and longer fire front. A wildfire could be too intense to fight, overwhelming firefighters as the 1991 fire did. The most intense wildfires vaporize the water used to oppose them, and water supply is not unlimited. Flaming embers blown ahead of the fire could start many additional fires over a large area. Emergency personnel could be forced to concentrate on evacuating residents rather than fighting the fire. It is unlikely that firefighting capacity could be increased to the point where these problems could be overcome in a major wildfire driven by Diablo winds.

In its report on the 1991 fire, FEMA's U.S. Fire Administration stated that "there are recognizable fire risk situations . . . that are clearly beyond the capabilities of fire suppression forces. Hazard reduction strategies should be the primary approach taken when these situations are recognized" (FEMA 1991). Until wildfire hazard is reduced, firefighting is not likely to be reliably effective. Therefore, firefighting improvements alone would not meet the purpose and need and were eliminated from further study.

### **3.3.3.3 Exterior Sprinkler Systems**

Exterior sprinkler systems can be used to spray water on structures in anticipation of a wildfire and during the fire. Sprinkler systems were apparently effective in protecting homes from the Ham Lake Fire in northeastern Minnesota in 2007 (Johnson et al. 2008). The Ham Lake area is sparsely populated and has abundant water resources. Johnson et al. reported that at the time of

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the fire, temperatures were above 80°F, relative humidity was less than 30%, and winds gusted to 30 mph.

Exterior sprinkler systems are likely to be less effective in the East Bay Hills. Diablo wind conditions in the East Bay Hills may include temperatures above 90°F, relative humidity below 10%, and sustained winds with gusts above 60 mph. Under these conditions, it is difficult to keep a building moist. Water evaporates very quickly and sprayed water is likely to be blown away from parts of the roof and walls (Smith et al. 1994).

Wildfires typically occur after periods of drought, when water supplies are low. Wildfires travel fast under Diablo wind conditions, and if sprinklers are not operated until it seems likely that a wildfire is approaching, it may be too late for the sprinklers to help. On the other hand, widespread use of sprinklers in anticipation of a wildfire's approach may strain water supplies in areas where the fire is already being fought.

The U.S. Fire Administration's report on the 1991 fire stated that "it may have been feasible to protect some of the structures with exterior sprinkler systems, if adequate water flows and pressures had been available and the more severe exposures to wildland fuels had been reduced" (FEMA 1991). The potential intensity of a wildfire must be reduced before sprinklers can be relied on to protect many structures. Therefore, exterior sprinkler systems would not meet the purpose and need and were eliminated from further study.

### **3.3.3.4 Roof Replacement**

The 1991 Oakland Tunnel Fire demonstrated the value of fire-resistant roofing materials (FEMA 1991) but also demonstrated their limitations. A fire-resistant roof reduces the likelihood that a flaming ember landing on the roof would ignite the structure and also reduces the likelihood that the roof would generate flaming embers that ignite other structures. However, a structure with a fire-resistant roof can still burn if the main fire reaches it or a firebrand is blown onto something flammable on the property other than the roof. In the 1991 fire, burning embers were blown up under the eaves of houses, causing ignition even in homes with tile roofs (FEMA 1991). This could be counteracted by also covering the eaves and walls with fire-resistant material, but the cost would be prohibitively high. Therefore, structural fireproofing would not meet the purpose and need and was eliminated from further study.

### **3.3.3.5 Management of Resprouts From Stumps Without Using Herbicides**

Management of resprouts without herbicides is expensive because it takes much more time. An untreated eucalyptus stump produces large numbers of sprouts and may continue producing them for many years. Repeated manual removal of sprouts is likely to be prohibitively expensive. Covering stumps with opaque plastic is time-consuming because the plastic must be attached securely to prevent the sprouts from pushing it off. Sprouts need light to continue growing but do not need light to begin growing. For this same reason, coating stumps with natural tar is unlikely to be effective. Management of resprouts without herbicides would not meet the purpose and need and was eliminated from further study.



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### **3.4 Alternatives Carried Forward for Additional Study**

Based on the process described in Section 3.3, the following alternatives were carried forward for additional study:

- No action alternative
- Proposed and connected actions

Although the no action alternative was the only alternative to the proposed and connected actions that was carried forward for additional study, FEMA can still require modification of the proposed and connected actions as a condition of funding the grant applications. Members of the public, organizations, and government agencies can recommend modifications of the proposed and connected actions in comments on the draft EIS. Any modifications required by FEMA would be included in FEMA's record of decision on the grant applications.

#### **3.4.1 No Action Alternative**

Under this alternative, FEMA would not fund any of the proposed grant applications, which are part of the proposed actions, and those activities would not be implemented. Activities each subapplicant would continue under the no action alternative are described in the following sections.

##### **3.4.1.1 UCB**

UCB would continue to participate in the Hills Emergency Forum and continue to work with other members of the forum to coordinate best land stewardship practices, public outreach and education, and other forum-related activities.

UCB would continue annual removal of grass and light, flashy fuels (such as twigs, needles, and grasses that ignite and burn rapidly) from UCB roadsides, UCB turnouts, and within 100 feet of UCB structures and adjacent private residences. UCB also would work to maintain the strategic areas where fuel reduction projects have been completed during the past 10 years to ensure eradication of target species of vegetation that have already been removed.

UCB would continue to pursue fuel reduction within 30 feet of private and public structures to create defensible space in accordance with its 2020 Hill Area Fire Fuel Management Program.

##### **3.4.1.2 Oakland**

Oakland would continue to participate in the Hills Emergency Forum and continue to conduct basic fire reduction activities, including removal of hazardous vegetation from roadsides.

##### **3.4.1.3 EBRPD**

EBRPD would continue to maintain areas where vegetation reduction has already been completed. EBRPD would continue to participate in the Hills Emergency Forum.

EBRPD is already implementing elements of the connected actions using funds from sources other than FEMA and vegetation management activities similar to those proposed in the grant

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applications are ongoing on EBRPD properties. However, because the greatest hazardous fire risk reduction benefits would only accrue if both the proposed and connected actions are implemented, hazardous fire risk reduction is not considered an effective outcome of the no action alternative.

### **3.4.2 Proposed and Connected Actions**

The proposed action consists of the vegetation management work included in four grant applications submitted to Cal EMA by UCB, Oakland, and EBRPD (the subapplicants), plus additional vegetation management work proposed in the same areas but not eligible for FEMA funding. The four grant applications are listed in Table 3-1. The proposed action is intended to reduce hazardous fire risk to people and structures in many areas in the East Bay Hills and Miller/Knox Regional Shoreline. This EIS also addresses vegetation management projects planned by EBRPD in many connected areas, as explained in Section 1. The connected project areas total 1,061 acres. The proposed activities associated with each grant application and the connected actions are described in the following sections. The proposed and connected project areas are shown in Figures 3-1a through 3-1j and summarized in Table 3-1. The overall area in which the proposed and connected actions would occur is shown in Figure 1-1 in Section 1.

FEMA may decide to fund one or several of the grant applications but not all of them. This decision would be based on an analysis of the ability of each grant to meet the purpose and need and on its feasibility, cost-benefit ratio, and environmental impacts. This EIS analyzes the environmental impacts of funding all four of the grant applications. Should FEMA decide not to fund all four applications, a supplement to the EIS would have to be prepared to assess the positive and negative effects of the decision.

The proposed and connected actions would involve cutting down many trees to reduce wildfire hazard. Targeted trees would be cut down and processed by trained, qualified subapplicant staff or contractors using methods consistent with the California Forest Practice Rules. If a timber harvest plan is required by § 4581 of the California Public Resources Code (Z'berg-Nejedly Forest Practice Act), the plan would be prepared by a registered professional forester and would contain detailed information on the timber operations. The California Forest Practice Rules and the Z'berg-Nejedly Forest Practice Act are available at

[http://calfire.ca.gov/resource\\_mgt/downloads/2012\\_California\\_Forest\\_Practice\\_Rules.pdf](http://calfire.ca.gov/resource_mgt/downloads/2012_California_Forest_Practice_Rules.pdf).

The proposed and connected actions would include best management practices identified by the San Francisco Bay Regional Water Quality Control Board to control erosion during and after vegetation management activities (see Section 5.3.2.3).

The proposed and connected actions involve use of herbicides. No spraying of foliage would occur within 60 feet of standing or flowing water or where herbicide might drift to water courses. Within this 60-foot buffer, herbicides would only be applied directly to stumps, and use of herbicides would be restricted to Garlon 3A or another triclopyr formulation approved for use near water. Within the 60-foot buffer, herbicides would be applied to stumps within 60 minutes of cutting down the tree. Herbicides would not be used in the 60-foot buffer within 24 hours after rain or when the chance of rain within 24 hours is greater than 40%. To prevent airborne drift of herbicide mist through the 60-foot buffer, herbicides would not be applied to foliage outside the

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buffer when wind speed is greater than 10 mph or less than 2 mph. Very low wind speeds are conducive to drift because very light winds are associated with inversion conditions in which mists and vapors tend to stay near the ground rather than dispersing upward.

**Table 3-1. Summary of Proposed and Connected Project Areas**

Project Area	Proposed Action Acres	Connected Action Acres	Total Acres
<b>UCB</b>			
Strawberry Canyon-PDM	56.3	0	56.3
Claremont-PDM	42.8	0	42.8
Subtotal	99.1	0	99.1
<b>Oakland</b>			
North Hills-Skyline-PDM	68.3	0	68.3
Caldecott Tunnel-PDM	53.6	0	53.6
Frowning Ridge-PDM (UCB project)	185.2	0	185.2
Tilden Regional Park-PDM (EBRPD project)	34.3	0	34.3
Sibley Volcanic Regional Preserve-PDM (EBRPD project)	3.9	0	3.9
Claremont Canyon-PDM (EBRPD project)	13.7	0	13.7
Subtotal	359.0	0	359.0
<b>EBRPD</b>			
Sobrante Ridge Regional Preserve	4.1	0	4.1
Wildcat Canyon Regional Park	65.6	46.6	112.2
Tilden Regional Park	97.7	194.2	291.9
Claremont Canyon Regional Preserve	21.6	130.4	152.0
Sibley Volcanic Regional Preserve	43.6	118.4	162.0
Huckleberry Botanic Regional Preserve	17.8	0.3	18.1
Redwood Regional Park	58.4	92.8	151.2
Leona Canyon Regional Open Space Preserve	4.6	0	4.6
Anthony Chabot Regional Park	200.0	478.2	678.2
Lake Chabot Regional Park	4.8	0	4.8
Miller-Knox Regional Shoreline	22.2	0	22.2
Subtotal	540.2	1,060.7	1,600.9
<b>TOTAL</b>	<b>998.3</b>	<b>1,060.7</b>	<b>2,059.0</b>



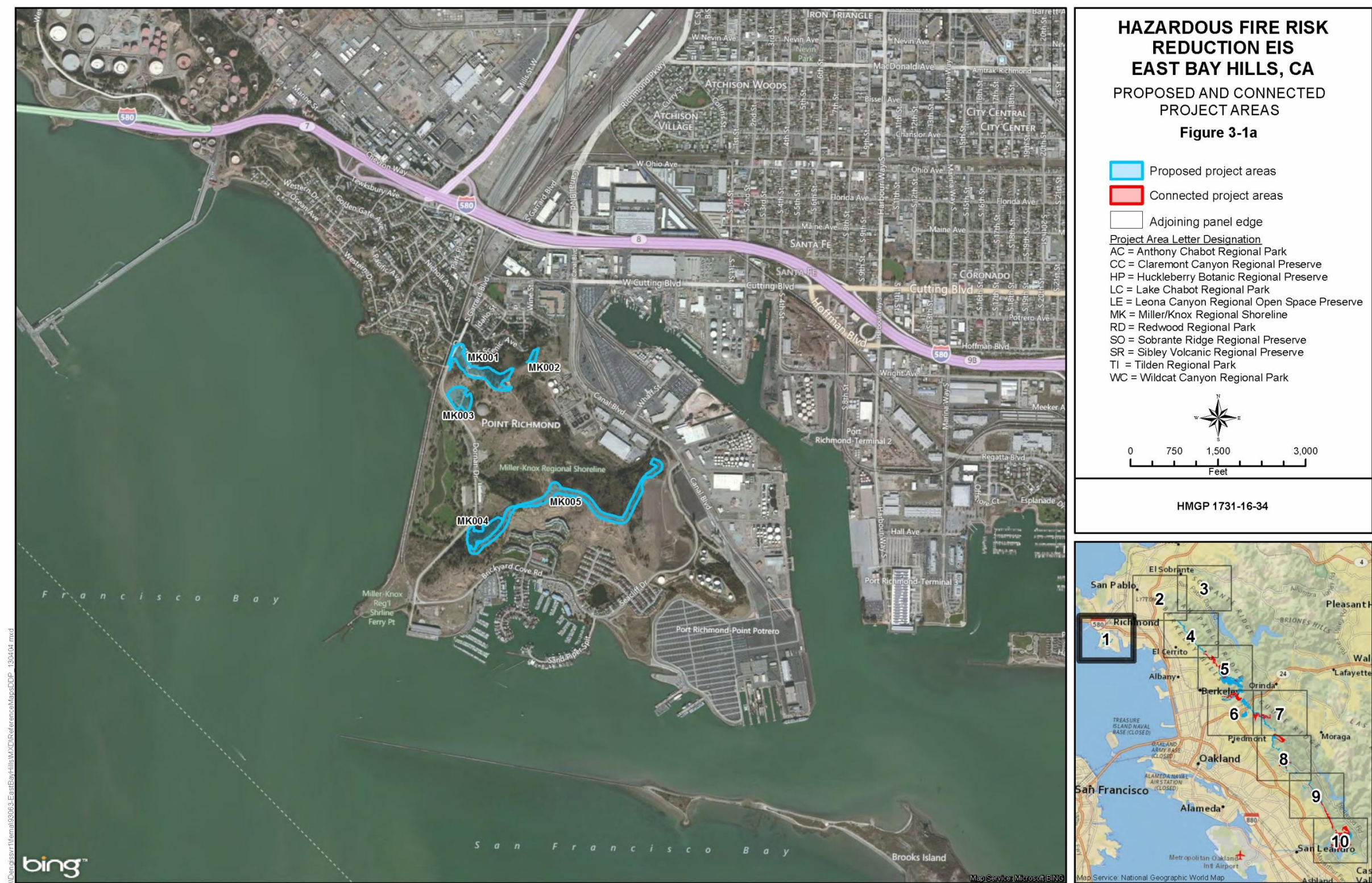


Figure 3-1a. Proposed and Connected Project Areas



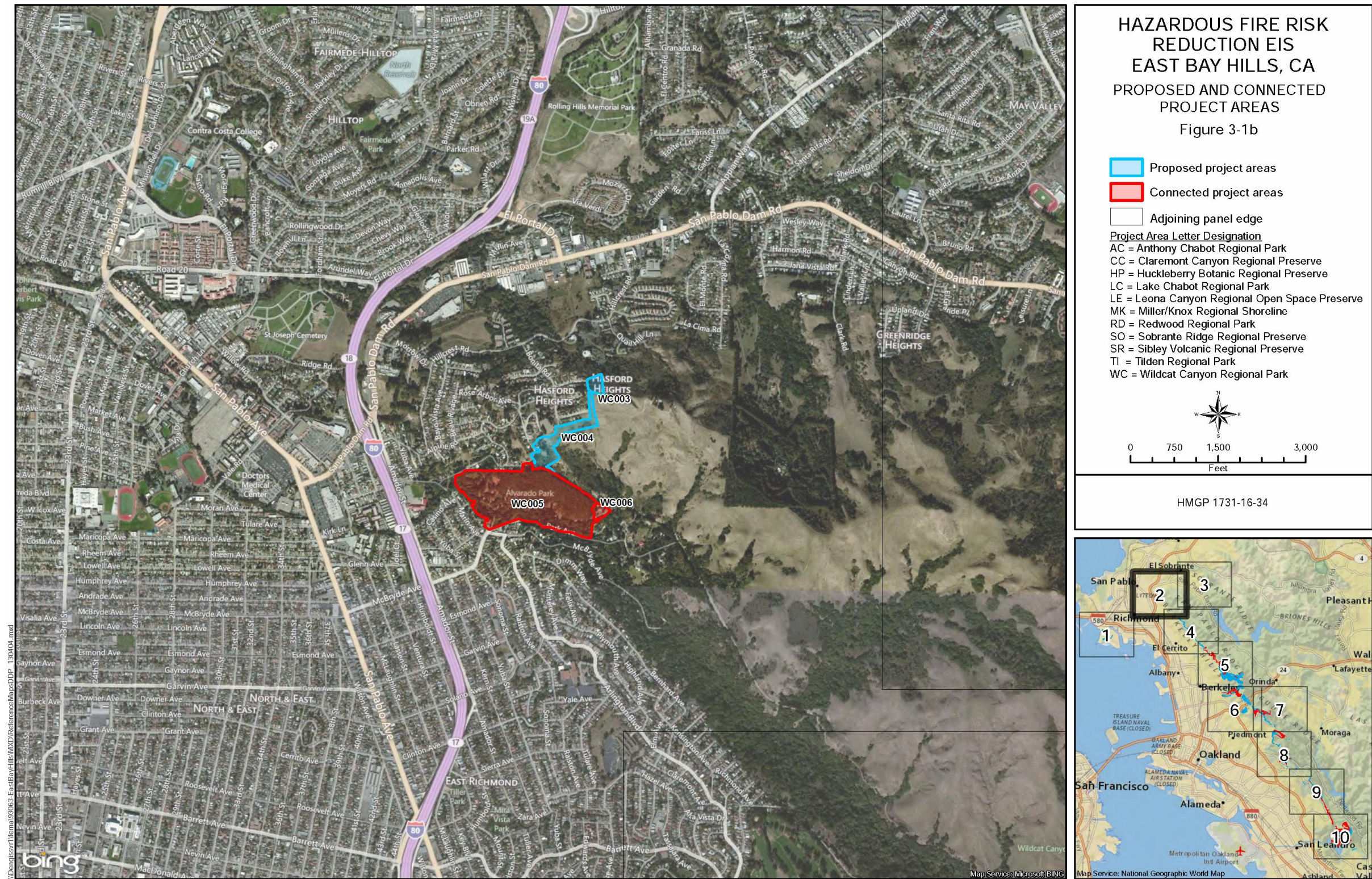
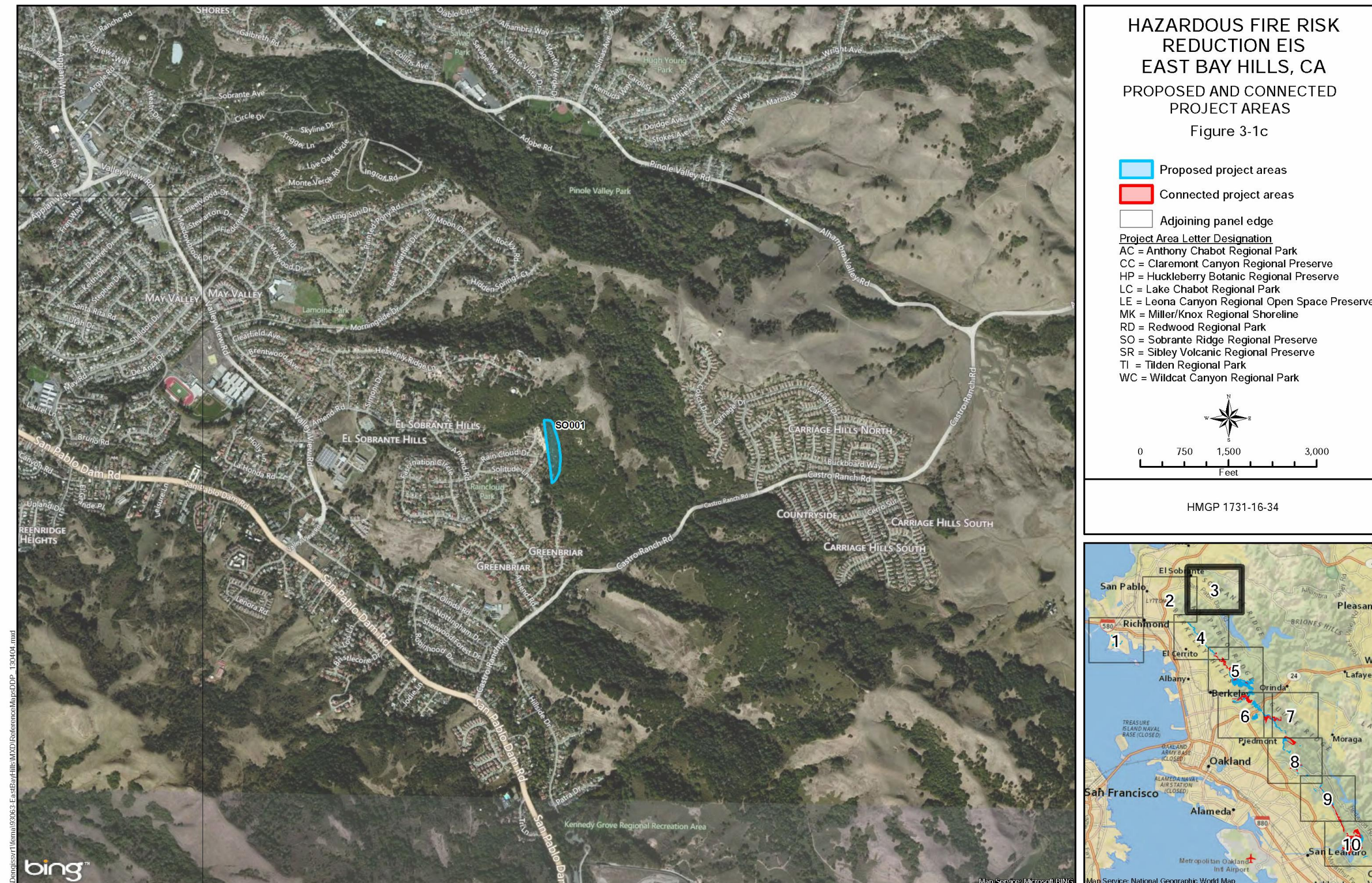


Figure 3-1b. Proposed and Connected Project Areas

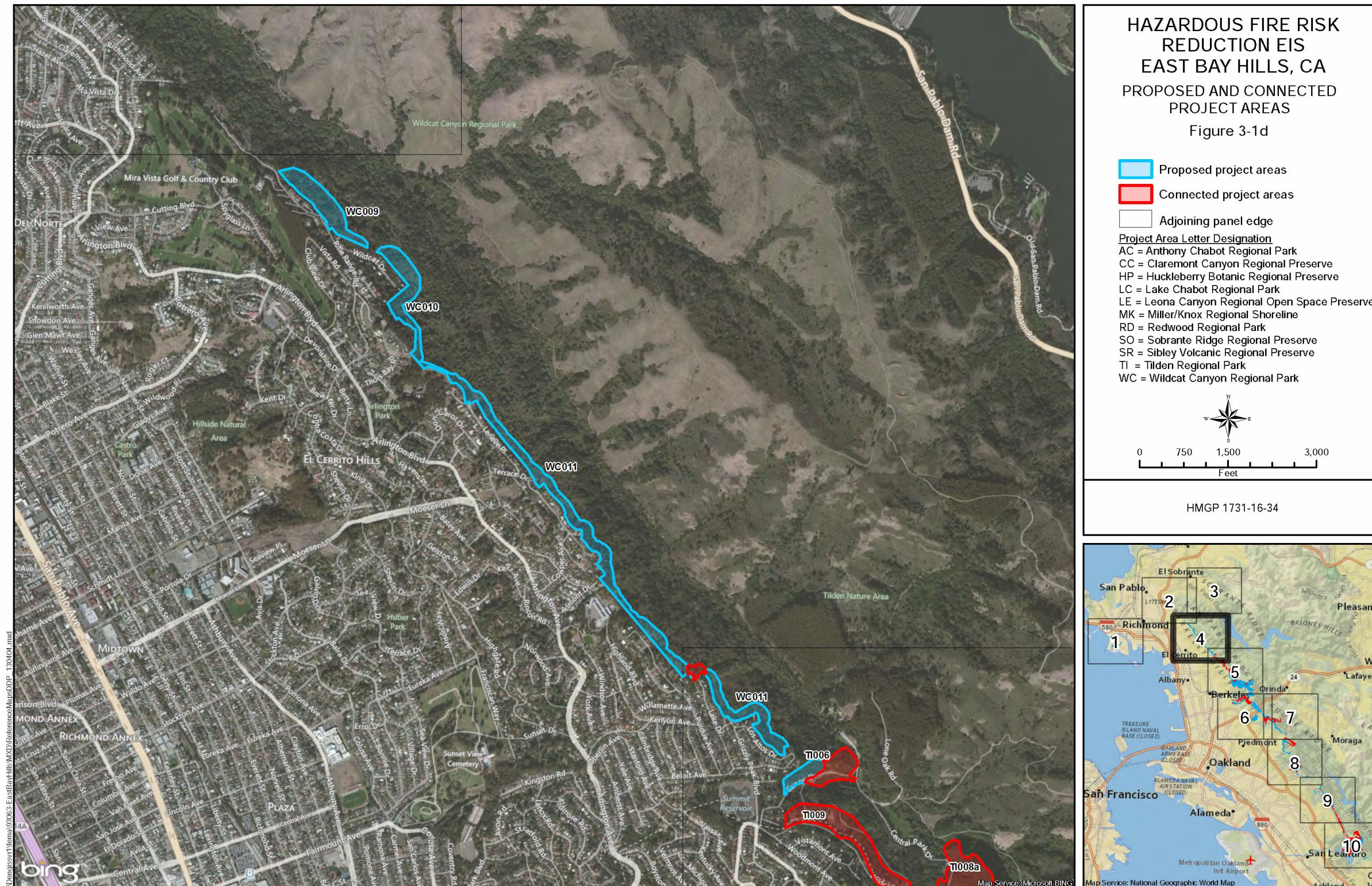




**Figure 3-1c. Proposed and Connected Project Areas**



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**Figure 3-1d. Proposed and Connected Project Areas**



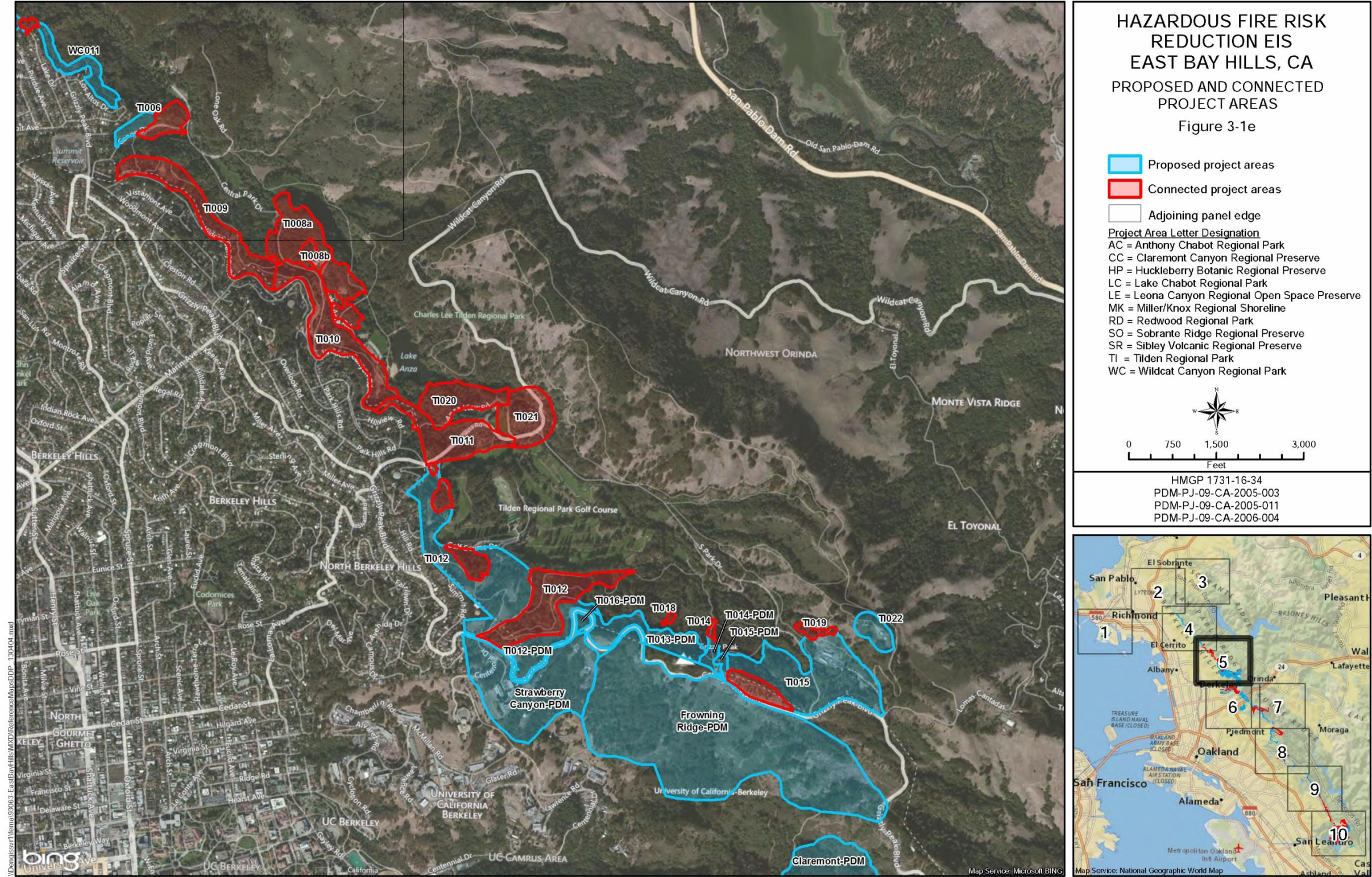


Figure 3-1e. Proposed and Connected Project Areas



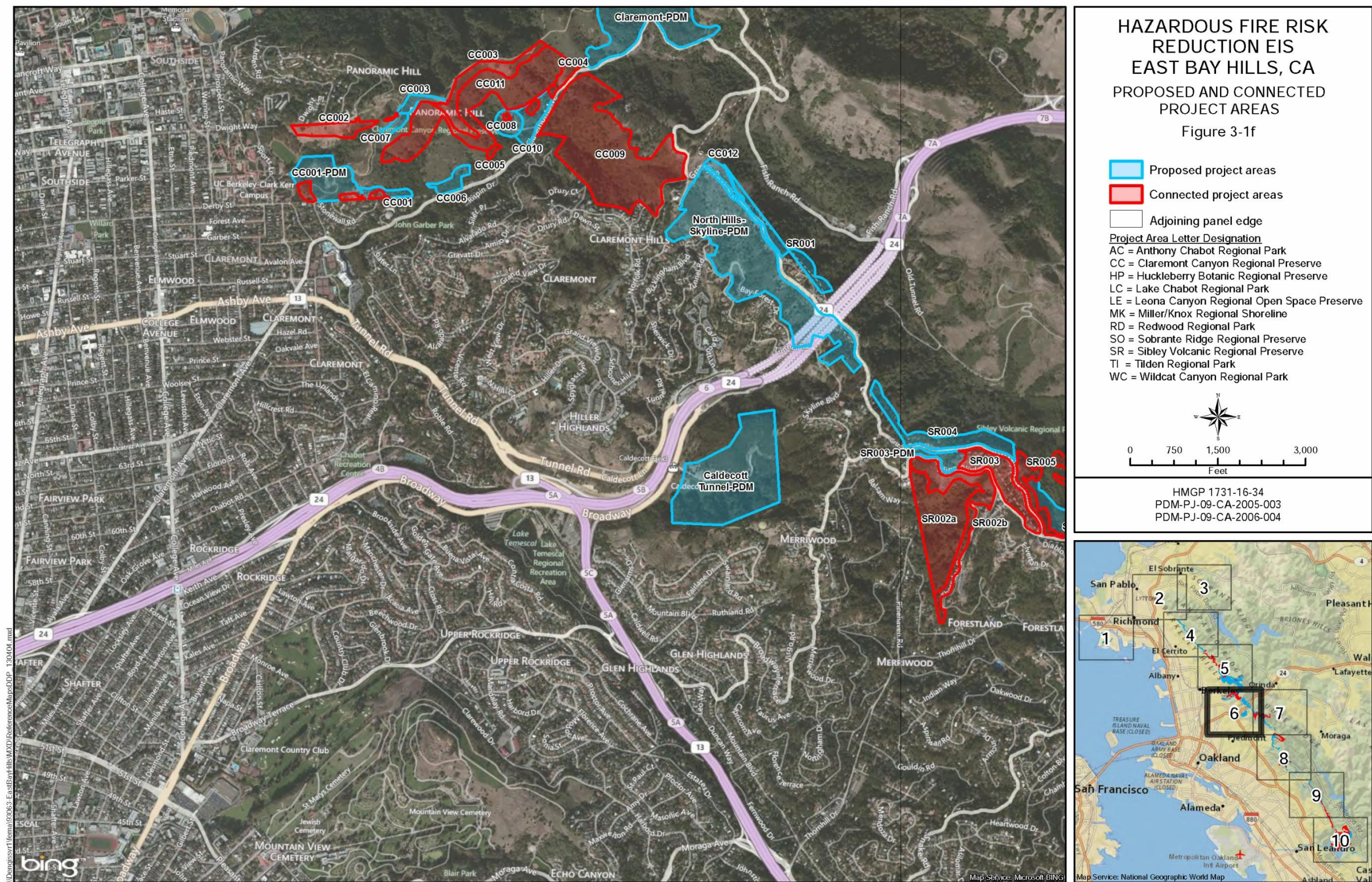


Figure 3-1f. Proposed and Connected Project Areas



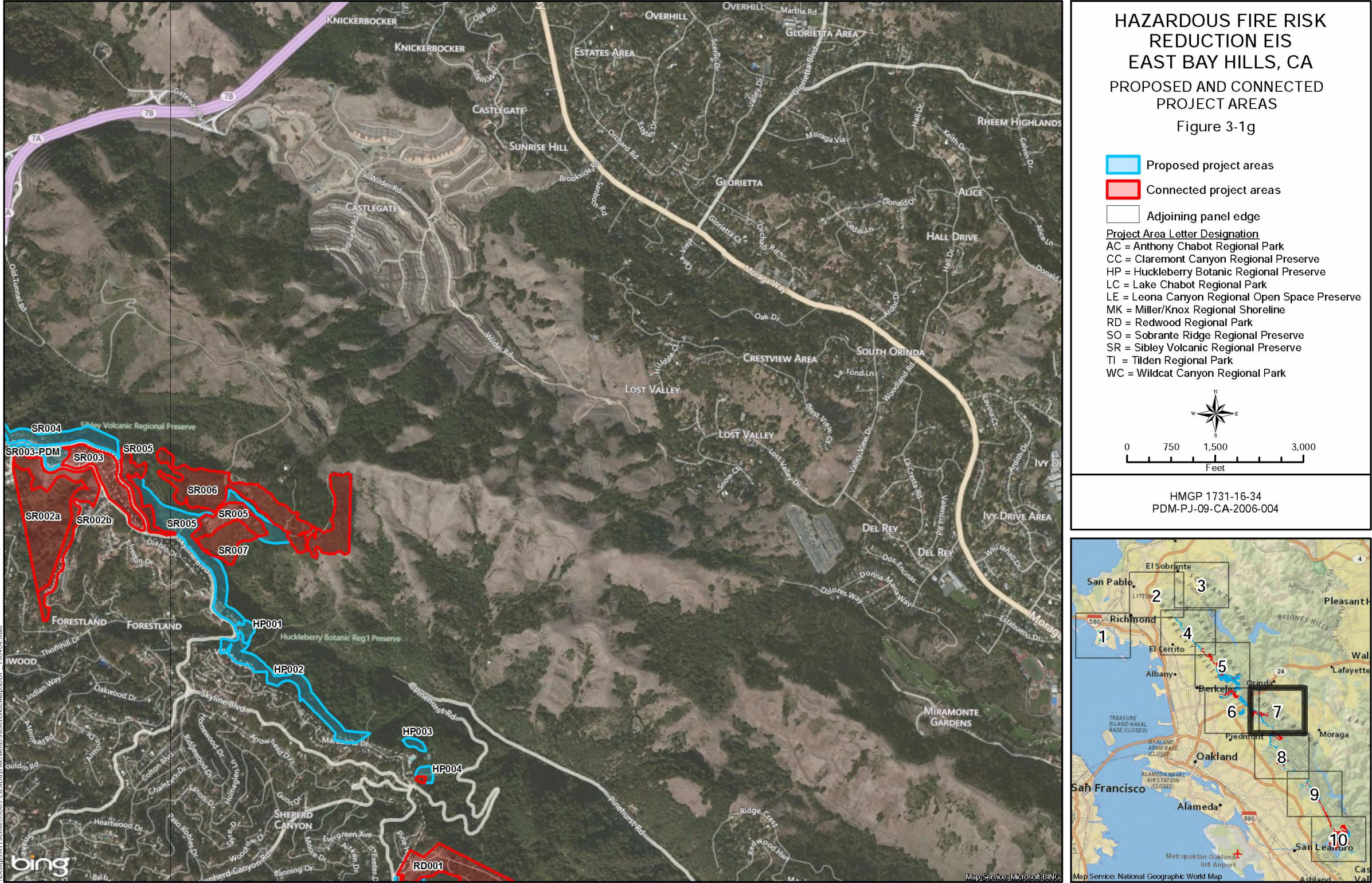


Figure 3-1g. Proposed and Connected Project Areas



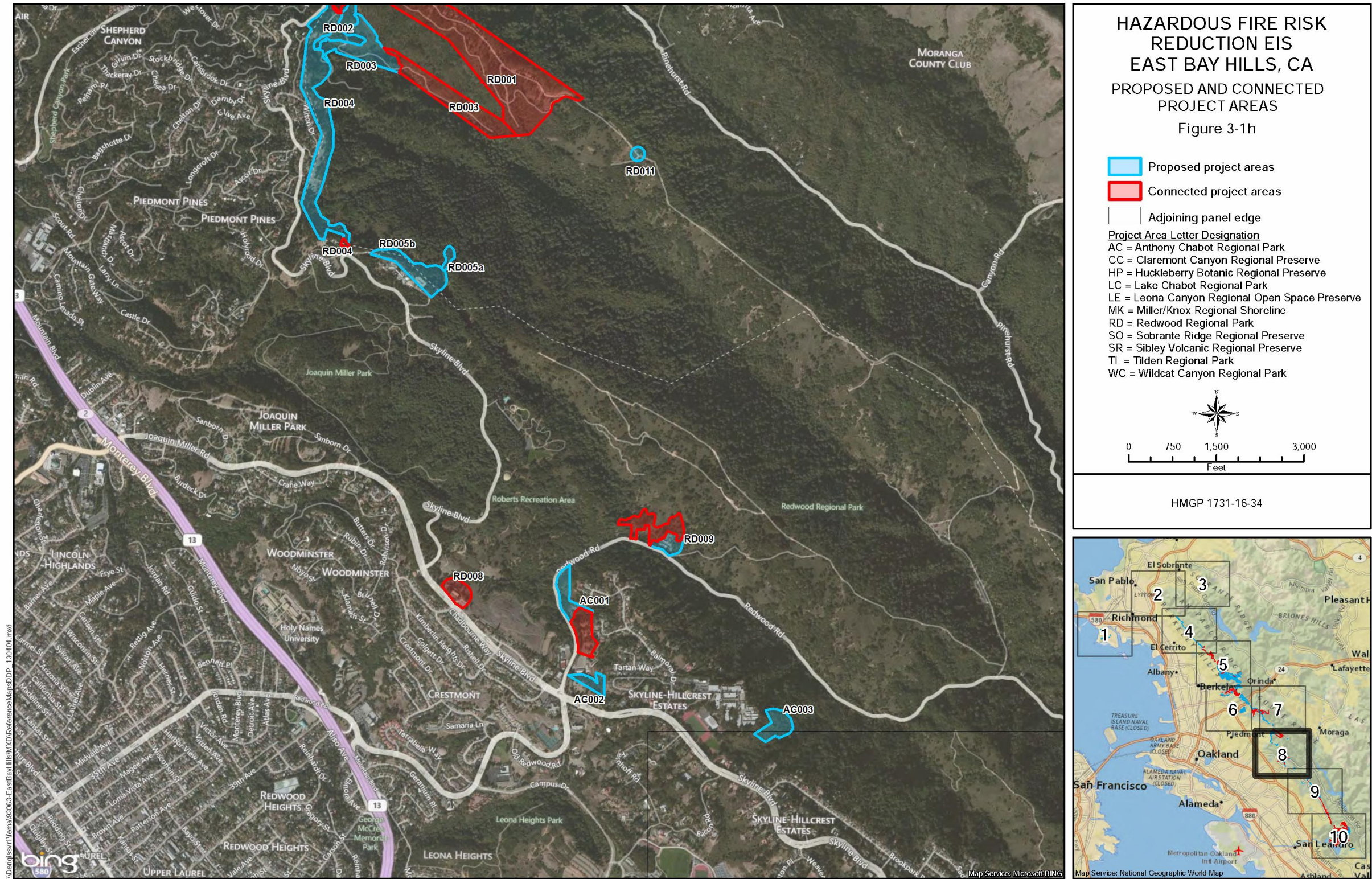


Figure 3-1h. Proposed and Connected Project Areas



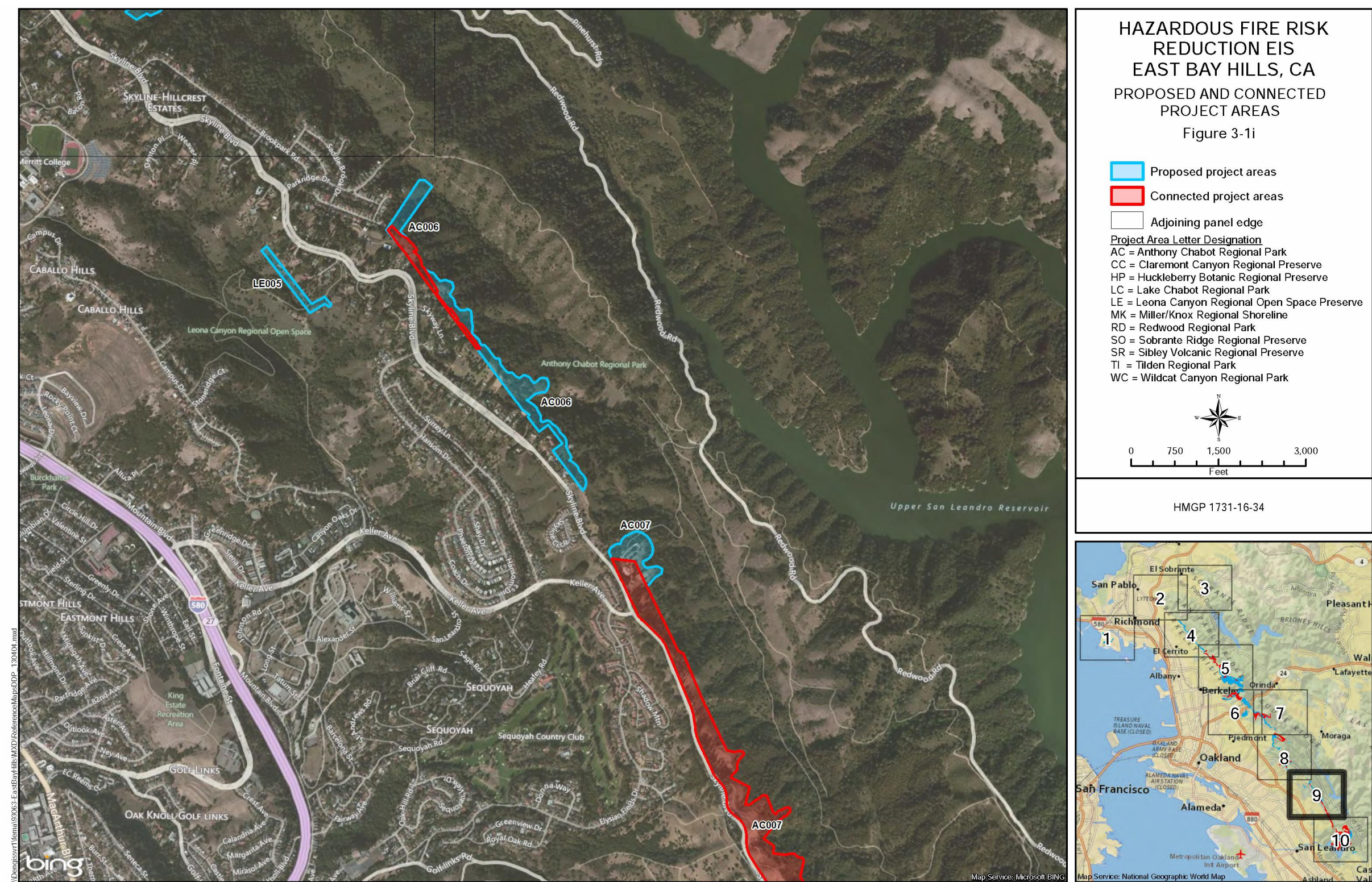


Figure 3-1i. Proposed and Connected Project Areas



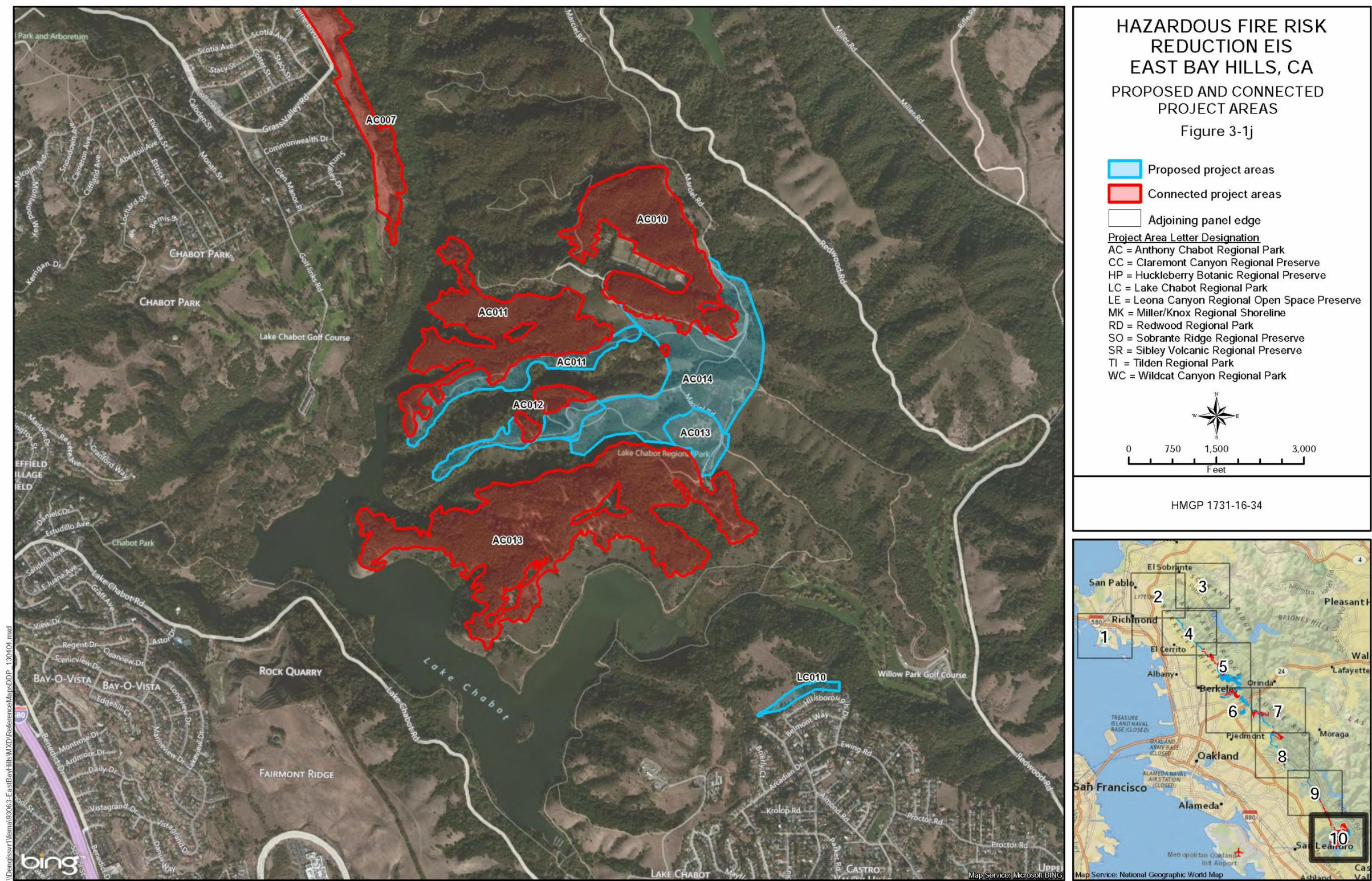


Figure 3-1j. Proposed and Connected Project Areas



## **Alternatives Including the Proposed and Connected Actions**

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### **3.4.2.1 UCB**

The proposed action includes two projects proposed in two PDM grant applications submitted by UCB. Application PDM-PJ-09-CA-2005-11 covers a 56-acre area designated Strawberry Canyon-PDM, and application PDM-PJ-09-2005-003 covers a 43-acre area designated Claremont-PDM. Both applications focus on removing non-native, fire-promoting trees. The proposed activities are described in the following subsections.

#### **3.4.2.1.1 Strawberry Canyon-PDM**

Non-native trees, including all eucalyptus, Monterey pine, and acacia, would be cut down. Eucalyptus and acacia would be prevented from resprouting by application of herbicides to the stumps. This is not necessary with pine because pines do not sprout from stumps. The goal is to reduce the amount of fuel on the site by allowing the forest to convert from a eucalyptus-dominated, non-native forest to a native forest of California bay laurel, oak, big-leaf maple, California buckeye, California hazelnut, and other native tree and shrub species currently present beneath the eucalyptus and other non-native trees. The native species would provide less fuel to potential wildfires than the non-native species currently provide.

Approximately 12,000 eucalyptus, pine, and acacia trees would be cut down. The trees would be cut using hand tools and a mechanized feller-buncher. Hand cutting would involve a pair of workers using chain saws and wedges to fell the tree in a direction that facilitates processing. The feller-buncher is a tracked vehicle with a self-leveling cab that mechanically grasps the standing tree, cuts it with a hydraulically powered chain saw, and arranges cut trees in bunches to facilitate dragging the tree out of the forest (skidding). The feller-buncher is limited to slopes of less than approximately 45%. Trees on steeper slopes or growing within 50 feet of watercourses would be cut down using hand-held equipment only; no heavy equipment would be used for cutting or chipping. The Strawberry Canyon-PDM project may involve closure of Centennial Drive for a few hours at a time to allow cutting and skidding of trees growing close to the road.

To prevent resprouting, an herbicide solution would be applied by a licensed qualified pesticide applicator to the cambium ring of eucalyptus and acacia stumps within 60 minutes of felling. The herbicide mixture would likely consist of a combination of Garlon<sup>1</sup> 4 or Garlon 3A (triclopyr) and Stalker<sup>2</sup> (imazapyr) in a solution of esterified seed oil, water, and marking dye. Garlon 3A would be used within 60 feet of running or standing water. A typical tree requires 1 to 2 ounces of diluted solution. Treatment of pine stumps is not necessary because pine stumps do not produce sprouts.

Felled trees up to approximately 24 inches in diameter at breast height (DBH) would be dragged (skidded) by rubber-tired or tracked vehicles along paths called skid trails to open areas called landings. A cable system may also be used to move logs to the landings without use of vehicles. When possible, UCB would use landings and skid trails from previous logging instead of constructing new ones. Nine landings are adjacent to fire trails or paved roads in the Strawberry

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<sup>1</sup> Garlon is a registered trademark of Dow AgroSciences.

<sup>2</sup> Stalker is a registered trademark of BASF.

## Alternatives Including the Proposed and Connected Actions

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Canyon-PDM area. Equipment would be staged, fueled, and maintained at these landings while contractors are mobilized. Additional landings may be created when the distance from a tree patch to an existing landing exceeds 600 feet. Environmentally sensitive areas would be avoided.

At the landings, trees would be chipped using a grapple-fed chipper or a tracked chipper. Whole trees would be fed into the chipper and pulled through the blades by a conveyor belt and feed wheel. Alternatively, the tracked chipper may be driven to downed trees on gentle slopes. The wood chips are expected to be between 1 and 4 inches long and would be spread on up to 20% of the site to a maximum depth of 24 inches. UCB would use some of the wood chips to create sediment traps. The maximum depth of chips would be used for the sediment trap to increase both the length of time the traps function and the amount of sediment that can be retained. Chips may also be spread to the maximum depth over uneven terrain and around stumps. Chips would be spread on skid paths to reduce disturbance of soil. UCB expects the chips to decompose in approximately 5 years, restoring the original contours of the portion of the site in which they would be spread and reducing the evidence of skid road creation.

Branches from trees greater than 24 inches DBH would be cut up and scattered on the site (lopped and scattered). The trunks of these trees would typically be cut into 20- to 30-foot lengths. The lop-and-scatter method also would be used when it is impractical to skid a tree to the chipper, such as when the tree is surrounded by vegetation to be preserved or when the tree is on a steep slope. In these cases, the downed tree would be cut by chain saws such that all portions of the tree would be within 24 inches of the ground. Some tree trunks would be placed to help control sediment and erosion or support wildlife habitat.

The objective is to leave all downed material on site. However, if the site yields a large number of large tree trunks, some may be moved to an adjacent portion of the hillside or shipped for use as fuel, a source of paper pulp, or horse bedding.

Completion of the proposed vegetation removal at Strawberry Canyon-PDM is expected to require 20 to 40 weeks spread over 2 to 3 years. In general, work would be conducted from August through November to avoid the wet season and the bird nesting and fledging season. Skidding would not be performed after a heavy rain. Cutting would begin in the northern section of the site and proceed south. Initial work contracts may be issued for several noncontiguous areas, for example, several 5-acre areas adjacent to Grizzly Peak Boulevard. Subsequent work areas would be contiguous to those already completed, each with a clear path to the existing landing areas.

Twice a year, herbicides (Garlon 4, Garlon 3A, Stalker, or Roundup<sup>3</sup> [glyphosate]) would be applied to any sprouts emerging from stumps. Eucalyptus seedlings emerging from seeds would be managed to prevent recolonization of the site by this invasive species. Follow-up treatments twice a year would include a low-volume herbicide spray applied to resprouted foliage between 3 and 6 feet in height. Follow-up treatments may also include a basal bark application or cutting the sprout and treating the cut surface with herbicide. On some resprouts and seedlings, Roundup may be applied to foliage in combination with Stalker. Use of herbicides would be subject to the

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<sup>3</sup> Roundup is a registered trademark of Monsanto.

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restrictions described on the first page of this Section 3.4.2. UCB anticipates that eradication of all eucalyptus resprouts and seedlings on the Strawberry Canyon-PDM site would take 7 to 10 years after the mature trees are cut.

### **3.4.2.1.2 Claremont-PDM**

Claremont-PDM is largely a eucalyptus forest. The proposed vegetation management activities and mitigation measures are the same as for Strawberry Canyon-PDM. About 10,000 trees would be cut down—mainly eucalyptus with some pine and acacia. As with Strawberry Canyon-PDM, the goal is complete eradication of eucalyptus, Monterey pine, and acacia.

Three temporary access roads are anticipated to be required for this project. The three roads would be 12 feet wide and total approximately 2,600 feet long. The roads would mainly follow existing logging roads created during work done in 1974 and 1975 when the site was last cleared. Earth moving would be required at the end of each trail and at switchbacks. Five landings are adjacent to existing fire trails or paved roads in the Claremont-PDM area.

UCB anticipates that completion of the proposed work would take 24 to 36 months, with 20 to 35 weeks of actual vegetation removal work. In general, work would be conducted in August through November to avoid the wet season and avian nesting and fledging seasons. Temporary closure of Claremont Avenue may be required during cutting and skidding of trees that are close to the roadway.

### **3.4.2.2 Oakland**

Oakland's grant application (PDM-PJ-09-CA-2006-004) includes six proposed projects in Alameda County near the Contra Costa County border. The projects would be implemented by Oakland, UCB, and EBRPD. The six projects are Oakland's North Hills-Skyline-PDM and Caldecott Tunnel-PDM projects; UCB's Frowning Ridge-PDM project; and EBRPD's Tilden Regional Park-PDM (Tilden-Grizzly), Sibley Volcanic Regional Preserve-PDM (Sibley Triangle and Island), and Claremont Canyon-PDM (Claremont Canyon-Stonewall) projects. The six proposed projects are described in the following subsections.

#### **3.4.2.2.1 North Hills-Skyline-PDM (Oakland)**

This proposed 68-acre proposed project area is on the southwest side of Grizzly Peak Boulevard north of State Route (SR) 24 and above the Caldecott Tunnel. It includes eucalyptus, pine, and brush. The 1991 Tunnel Fire began at the northwestern end of this site, and the entire site burned. The proposed action would extend the fuel break created by previous UCB and EBRPD projects. Oakland's goals are to eradicate eucalyptus and Monterey pine and to convert brush to grassland along Grizzly Peak Boulevard to create a ridgeline fuel break. In the southeastern portion of the proposed project area, removal of eucalyptus would promote emergence of a native forest of California bay, oak, maple, buckeye, and hazelnut, which produce smaller amounts of fuel.

The site would be accessed from pullouts along Grizzly Peak Boulevard, Tunnel Road, and Skyline Boulevard. No new access roads would be created. Trees would be cut by directional hand felling or by feller-bunchers. Eucalyptus would be chipped, and the chips would be spread

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over a maximum of 20% of the site at a maximum depth of 24 inches. The site burned intensely in the 1991 Tunnel Fire, so few if any eucalyptus on the site are too large to chip. Monterey pines would be cut up and scattered on the site. Pines would be cut using hand-held equipment except where a feller-buncher can cut them from the road.

To suppress resprouting of eucalyptus, the cambium ring of stumps would be chemically treated with a combination of Garlon4 and Stalker in a solution of esterified seed oil, water, and marking dye. Eucalyptus resprouts and new seedlings would receive follow-up herbicide treatment twice a year with Garlon4, Stalker, or Roundup as required to eliminate eucalyptus from the site. Use of herbicides would be subject to the restrictions described on the first page of this Section 3.4.2.

### **3.4.2.2.2 Caldecott Tunnel-PDM (Oakland)**

The 54-acre Caldecott Tunnel-PDM proposed project area is on the east side of Broadway and SR 24, south of the southwestern end of the Caldecott Tunnel. The site can be accessed from Broadway or from Skyline Boulevard to the northeast. Eucalyptus trees in the northern portion of the site produce large amounts of flammable debris and prevent development of understory vegetation. Other portions of the site contain oak-bay woodlands, mesic north coastal scrub, and a disturbed area containing a parking lot and ballfields.

Proposed activities are limited to the areas dominated by eucalyptus, which are in the northern and eastern sections of the site. Oakland's goal for Caldecott Tunnel-PDM is conversion from a eucalyptus-dominated forest to annual grassland and eventually to coastal scrub.

The site would be accessed from Broadway and from pullouts along Skyline Boulevard to the northeast. Trees would be cut using hand tools or mechanized feller-bunchers. Eucalyptus would be chipped, and the chips would be spread on up to 20% of the site with a maximum depth of 24 inches. The site burned intensely in the 1991 Tunnel Fire, so few if any eucalyptus on the site are too large to chip. The project site does not contain a significant number of pine trees. During logging, every reasonable effort would be made to minimize damage to native understory plants and disturbance of soil.

To suppress resprouting of eucalyptus, the cambium ring of stumps would be treated with a combination of Garlon4 and Stalker in a solution of esterified seed oil, water, and marking dye. All eucalyptus resprouts and eucalyptus seedlings would receive follow-up treatment with Garlon4, Stalker, or Roundup twice a year.

### **3.4.2.2.3 Frowning Ridge-PDM (UCB)**

UCB owns the 185-acre Frowning Ridge proposed project area. UCB would remove non-native vegetation, including all eucalyptus, Monterey pine, and acacia. The goal of this project is to reduce the amount of fuel on the site by allowing the forest to convert from a eucalyptus-dominated, non-native forest to a native forest of California bay laurel, oak, and native grass and shrub species present beneath the non-native trees. The native species would provide less fuel for potential wildfires than the non-native species currently provide. Portions of the site would convert to coastal scrub or coyote brush scrub.

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Approximately 25,000 eucalyptus and pine trees up to 48 inches DBH would be cut down. Many of the trees are more than 100 feet tall. The same procedures described for the Strawberry Canyon-PDM project in Section 3.4.2.1.1 above would be used for tree removal, management of cut material, suppression of resprouting from stumps, and suppression of seedlings at Frowning Ridge-PDM.

Closure of Grizzly Peak Boulevard for a few hours at a time may be required during cutting and skidding of trees close to the roadway. The Upper Jordan Fire Trail, an unimproved road on UCB land, would be closed to the public as necessary during logging. UCB would coordinate with local fire departments to permit emergency access or alternative access to the land served by the fire trail.

When possible, UCB would use landings and skid trails from previous loggings instead of constructing new ones. UCB anticipates that one additional temporary access road approximately 200 feet long and 12 feet wide would be needed and that earth moving would occur along the entire length of the temporary road.

Twelve landings exist adjacent to fire trails or paved roads in the project area. Equipment would be staged, fueled, and maintained at these landings while contractors are mobilized. Additional landings may be created when the distance from a tree patch to an existing landing exceeds 600 feet. Environmentally sensitive areas would be avoided.

Completion of the proposed vegetation removal at Frowning Ridge-PDM is expected to require 40 to 60 weeks spread over 2 to 3 years. In general, work would be conducted from August through November to avoid the wet season and the bird nesting and fledging season. Skidding would not be performed after a heavy rain. Cutting would begin in the northern section of the site and proceed south. Initial work contracts may be issued for several noncontiguous areas, for example, 8 acres of cutting adjacent to each of the two lower landings in the first year. Subsequent work areas would be contiguous to those already completed, each with a clear path to the existing landing areas.

### **3.4.2.2.4 Tilden Regional Park-PDM (EBRPD)**

This proposed EBRPD project includes five proposed project areas in Tilden Regional Park on the opposite side of Grizzly Peak Boulevard from Strawberry Canyon-PDM and Frowning Ridge-PDM. The proposed project areas are designated TI012-PDM through TI016-PDM and total 34.3 acres. The most abundant types of vegetation are eucalyptus forest and oak-bay woodland. EBRPD would convert the majority of the eucalyptus and smaller amounts of coyote brush scrub and coastal scrub to successional grassland. The oak-bay woodland and the small amounts of riparian woodland and redwood forest in these project areas would be preserved.

EBRPD's approach to implementation of its proposed and connected projects is described in Section 3.4.2.3.

### **3.4.2.2.5 Sibley Volcanic Regional Preserve-PDM (EBRPD)**

This proposed EBRPD project would occur on a 3.9-acre site designated SR003 at the southwestern edge of the preserve in the western portion of a narrow strip of land between

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Grizzly Peak Boulevard and Skyline Boulevard. This area is referred to as the Sibley Island. The most abundant types of vegetation in this project area are oak-bay woodland and coastal scrub, with smaller amount of successional grassland and eucalyptus forest. EBRPD would convert the eucalyptus and most of the coastal scrub to successional grassland. The oak-bay woodland would be preserved.

EBRPD's approach to implementation of its proposed and connected projects is described in Section 3.4.2.3.

### **3.4.2.2.6 Claremont Canyon Regional Preserve-PDM (EBRPD)**

This proposed EBRPD project is also referred to as Claremont Canyon-Stonewall. It would occur in a 13.7-acre proposed project area designated CC001-PDM at the western end of the preserve. The dominant type of vegetation is eucalyptus forest. EBRPD would thin existing dense eucalyptus stands, favoring retention of the larger trees, to create an open eucalyptus stand with minimal understory. Elsewhere, oak-bay woodland and California annual grassland on the site would be preserved.

No more than 25% of the cut material, with a 6-inch maximum diameter, would be left on site in piles. The other 75% of the cut material would be removed from the site. The cut woody material left on site would later be disposed of by burning under prescribed weather and fuel conditions. EBRPD would use hand labor and/or animal grazing to maintain the site.

EBRPD's approach to implementation of its proposed and connected projects is described in Section 3.4.2.3.

### **3.4.2.3 EBRPD**

EBRPD's grant application (HMGP 1731-16-34) proposes hazardous fire risk reduction measures on 540 acres in 11 regional parks. This EIS also addresses connected hazardous fire risk reduction measures planned by EBRPD on 1,061 acres in seven of the same parks. EBRPD's priority is to reduce fuel load and sources by suppressing the density of undesirable invasive plant species within the proposed and connected project areas. EBRPD would accomplish this through implementation and long-term maintenance of tree and brush removal (mechanical and hand), herbicide treatment, and, although not funded by FEMA, animal grazing, pile burning, and broadcast burning.

The majority of the vegetation management work would focus on reducing the amount of non-native invasive species of trees and shrubs, such as eucalyptus, Monterey pine, acacia species, and French broom. French broom is a shrub that is a component of brush and coastal scrub. Quantities of native shrubs, such as coyote brush and sage, would also be reduced in some areas to further reduce the amount of fuel available to a wildfire.

EBRPD would seek to increase the amount of successional grassland, which is grassland with islands of shrubs. Native vegetation, such as oak-bay woodland, would be protected and promoted through reduction of eucalyptus, pine and acacia. To further reduce fuel available to a wildfire, woody debris would be removed from oak-bay woodlands, and low branches would be cut off. In areas where oaks and bays are overly dense, these trees may be thinned, favoring

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retention of healthy, larger oaks and bays to increase the fire resilience of the residual stand. Native redwood forests would be left as they are.

Brush would be thinned to reduce the amount of fuel available to a fire and to create gaps in the available fuel. Brush habitat would be maintained and increased in quality where possible.

Perennial and annual grasses would be managed to maintain open grassland habitat, reduce brush encroachment, increase native species diversity, reduce fuel loads, and maintain travel corridors for native wildlife. Aquatic, wetland, and riparian habitat would be managed to protect and encourage expansion of these habitats. Measures would be implemented to prevent erosion or sedimentation into these habitats.

EBRPD's vegetation management methods are based on its Wildfire Hazard Reduction and Resource Management Plan (EBRPD 2009b). The plan is available at <http://www.ebparks.org/stewardship/fuelsplan/plan>. The plan recommends selective thinning of areas dominated by non-native invasive species that contribute fuel to wildfires. Eucalyptus, Monterey pine, and acacia trees would be targeted to reduce the number of trees per acre or remove entire groves. Lower limbs would be removed from remaining trees and woody debris would be removed from under the trees.

In most cases, desirable vegetation growing beneath eucalyptus would be protected and promoted to replace eucalyptus over time. Logs would be placed and retained as a component of the sediment and erosion control measures and to improve wildlife habitat and promote long-term soil productivity. Trees would be removed from the project areas or, in some cases, chipped and left on site. Wood chips left on site would be spread over up to 20% of each site to an average depth of 4 to 6 inches. In addition, although not funded under the HMGP, pile burning and in a few cases area burning would be used under prescribed and permitted conditions to dispose of some of the cut woody material.

Eucalyptus and acacia stumps would be treated with herbicide to prevent or reduce resprouting. Pine stumps do not require treatment because they do not produce sprouts. The herbicide application would include Garlon 4 Ultra or Garlon 3A, a colorant, and an approved carrier agent, such as Hasten oil, water, or other product indicated as acceptable on the product label. EBRPD would apply herbicides in accordance with the instructions on the product label, guidance of the California Department of Pesticide Regulation, and restrictions described on the first page of this Section 3.4.2.

Trees within 50 feet of the high water mark of a continuous or intermittent stream would be cut using hand-held equipment. No self-propelled equipment would enter the 50-foot buffer to be used for either removal or processing of vegetation.

Seedlings of eucalyptus, Monterey pine, and acacia would be hand-pulled or chemically treated depending on size. Seedlings 3 to 6 feet tall that are too difficult to pull out would be treated by hand-spraying their leaves with herbicide. Seedlings over 6 feet in height would be cut no more than 18 inches above the ground and herbicide would be hand-sprayed on the cut stubble. Noxious weeds, such as poison oak, would be treated by spraying their leaves if this could be done without affecting nontargeted plants. If the sprayed herbicide would drift onto nontargeted

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plants, the weeds would be cut and herbicide would be sprayed on the cut stubble. No spraying of foliage would occur within 60 feet of standing or flowing water or when wind speed is greater than 10 miles per hour (mph) or less than 2 mph (see explanation on the first page of this section 3.4.2).

Best management practices for erosion control would be implemented during and after vegetation removal.

In the maintenance phase, sprouts growing from cut stumps would be treated by hand-spraying herbicide on their leaves or by cutting them and hand-spraying the cut stubble. Poison oak may be selectively treated as required for worker safety in accordance with California Occupational Safety and Health Administration guidelines. No spraying of foliage would occur within 60 feet of standing or flowing water or when wind speed is greater than 10 mph or less than 2 mph.

Frequency of maintenance treatment would depend on the effectiveness of initial treatment. Stumps would be treated with herbicide up to two times a year until the stump no longer produced sprouts. This typically requires two treatments. Growth of seedlings is highly variable because it is influenced by rainfall, temperature, chip depth, shading by other vegetation, and other factors. It is expected that seedlings would be pulled up to twice a year.

For long-term maintenance, sprouts from stumps would be treated annually. In addition, eucalyptus sprouting from seeds would be managed over time. Experience has demonstrated that most pine and eucalyptus seeds are exhausted within 5 to 7 years of cutting down the trees if no mature trees of these species remain.

For each of the eleven parks in which EBRPD's proposed and connected actions would occur, the locations of the project areas and EBRPD's vegetation management goals are described in the following subsections.

### **3.4.2.3.1 Sobrante Ridge Regional Preserve**

Sobrante Ridge Regional Preserve contains proposed project area SO001, a 4.1-acre area on the western edge of the preserve, opposite the eastern end of Rain Cloud Drive. The dominant type of vegetation is oak-bay woodland. EBRPD would convert 0.56 acres of northern maritime chaparral to successional grassland to enhance growing conditions for pallid Manzanita, a federally designated threatened species (see Section 4.2.3). The oak-bay woodland would be preserved.

### **3.4.2.3.2 Wildcat Canyon Regional Park**

Eight proposed and connected project areas totaling 112 acres are located in Wildcat Canyon Regional Park. Proposed project areas WC003 and WC004 are adjacent to the Hasford Heights community, and connected project areas WC005 and WC006 are south of Hasford Heights in Alvarado Park, a section of Wildcat Canyon Regional Park. Proposed project areas WC009, WC010, and WC011 and connected project area WC011 extend along the western border of the park and the eastern borders of El Cerrito and Kensington. The principal vegetation types in the Wildcat Canyon Regional Park project areas are oak-bay woodland, eucalyptus forest, and coastal scrub. EBRPD would convert most of the coastal scrub, almost half of the eucalyptus



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forest, and smaller amounts of coyote brush scrub and non-native pine forest to successional grassland, except that in proposed project area WC004, 2.4 acres of coastal scrub would be converted to California annual grassland. Oak-bay woodland would be preserved in all project areas. Riparian woodland would be preserved in the project areas where it occurs: WC009-proposed and WC011-connected. Redwood forest would be preserved in the only project area in which it occurs, WC005-connected.

### 3.4.2.3.3 Tilden Regional Park

Tilden Regional Park contains four proposed project areas totaling 97.7 acres that are included in EBRPD's grant application. In addition, the park contains 13 connected project areas totaling 194 acres. The project areas are near Grizzly Peak Boulevard or residential areas on the east side of Grizzly Peak Boulevard and extend from near the southeastern corner of Kensington to Vollmer Peak. The most abundant vegetation types are eucalyptus forest and oak-bay woodland. EBRPD would convert about half of the eucalyptus forest and smaller amounts of coastal scrub, coniferous forest (trees that produce cones), and coyote brush scrub to successional grassland. Oak-bay woodland, redwood forest, riparian woodland, and California annual grassland would be preserved.

### 3.4.2.3.4 Claremont Canyon Regional Preserve

Claremont Canyon Regional Preserve contains seven proposed project areas totaling 21.6 acres that are included in EBRPD's grant application. In addition, the park contains eight connected project areas totaling 130 acres. The project areas are throughout the preserve on both sides of Claremont Avenue in Oakland. The dominant vegetation type is coastal scrub, followed by oak-bay woodland. EBRPD would convert most of the coastal scrub and smaller amounts of coyote brush scrub, eucalyptus forest, California annual grassland, and broom scrub to successional grassland. Oak-bay woodland would be preserved.

### 3.4.2.3.5 Sibley Volcanic Regional Preserve

Sibley Volcanic Regional Preserve contains four proposed project areas totaling 43.6 acres that are included in EBRPD's grant application. In addition, the park contains six connected project areas totaling 118 acres. The project areas are in the southern section of the preserve on both sides of Grizzly Peak Boulevard. A section of the preserve in Oakland called the Sibley Triangle is included in connected project areas. The two most abundant vegetation types are eucalyptus forest and oak-bay woodland. EBRPD would convert about two-thirds of the eucalyptus forest and smaller amounts of coastal scrub, non-native pine forest, broom scrub, and coyote brush scrub to successional grassland. Oak-bay woodland would be preserved. Riparian woodland would be preserved in the project areas where it occurs: SR005-proposed and SR005-connected.

### 3.4.2.3.6 Huckleberry Botanic Regional Preserve

Huckleberry Botanic Regional Preserve contains proposed project areas HP001 through HP004, which total 17.8 acres, and also contains a 0.3-acre connected project area designated HP004. The project areas extend along the southern edge of the preserve, adjacent to a residential area on the north side of Skyline Boulevard. The majority of these project areas is oak-bay woodland.

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EBRPD would convert about two-thirds of the northern maritime chaparral, about half of the eucalyptus, and a portion of the coastal scrub to California annual grassland and successional grassland. The oak-bay woodland would be preserved. Pallid Manzanita would be protected and encouraged to expand.

### **3.4.2.3.7 Redwood Regional Park**

Redwood Regional Park contains eight proposed project areas totaling 58.4 acres and five connected project areas totaling 92.8 acres. Most of these areas extend along the east side of Skyline Boulevard at the northwest end of the park, adjacent to single-family homes, or extend eastward from that area along trails into the park. Other project areas are on Redwood Road and Skyline Boulevard in the south-central section of the park. The principal vegetation types in the Redwood Regional Park project areas are non-native pine forest, eucalyptus forest, and oak-bay woodland. Most eucalyptus in the East Bay Hills is blue gum eucalyptus, but most of the eucalyptus in Redwood Regional Park is red gum eucalyptus.

EBRPD would convert substantial portions of the non-native pine forest and smaller amounts of coyote brush scrub, coastal scrub, native coniferous forest, and broom scrub to successional grassland. In addition, two small areas of coyote brush scrub would be converted to California annual grassland. More than 30 acres of red gum eucalyptus would be retained as thinned eucalyptus forest with a sparse understory. Riparian woodland would be preserved in the two project areas where it occurs: RD003-proposed and RD003-connected.

### **3.4.2.3.8 Leona Canyon Regional Open Space Preserve**

Leona Canyon Regional Open Space Preserve contains proposed project area LE005, a 4.6-acre area on the eastern edge of the preserve adjacent to a residential area off Skyline Boulevard. This project area is dominated by coastal scrub. EBRPD would convert most of the coastal scrub and a small area of pine forest to successional grassland. A small area of oak-bay woodland would be preserved.

### **3.4.2.3.9 Anthony Chabot Regional Park**

Anthony Chabot Regional Park contains nine proposed project areas totaling 200 acres and eight connected project areas totaling 478 acres. Because the relative abundance of different types of vegetation varies greatly among the project areas in the park, the project areas are discussed in four groups in the paragraphs that follow.

Proposed and connected project areas designated AC001, AC002, AC003, and AC006 are in the northern half of the park, north of Keller Avenue. These project areas total 47.7 acres. The most abundant vegetation types in these project areas are oak-bay woodland and coastal scrub, and less than 4% of these areas is eucalyptus forest. EBRPD would convert most of the coastal scrub and smaller amounts of coyote brush scrub, pine forest, and eucalyptus forest to successional grassland. In proposed project area AC002, coastal scrub and a small amount of non-native pine forest would be converted to California annual grassland. Oak-bay woodland would be preserved.

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The project areas designated AC007-proposed and AC007-connected extend south-southeast along Skyline Boulevard from Keller Avenue. These project areas total 97.6 acres. The principal types of vegetation in these project areas are successional grassland, eucalyptus forest, and California annual grassland. EBRPD would convert half of the eucalyptus forest and smaller amounts of coastal scrub, pine forest, and coyote brush scrub to successional grassland. The California annual grassland, 7.2 acres of Oak-bay woodland, and a small amount of redwood forest would be preserved.

Connected project area AC014 and proposed and connected project areas designated AC010 through AC013 are north of Lake Chabot. These project areas total 440 acres, of which 384 acres is eucalyptus forest. EBRPD would convert half of the eucalyptus and much smaller amounts of coyote brush scrub, coastal scrub, and California annual grassland to successional grassland. The small amount of oak-bay woodland in these project areas, 1.9 acres, would be preserved.

Proposed project area AC014 is also north of Lake Chabot, among the project areas discussed in the previous paragraph. The 92.5 acres of this project area include 58.1 acres of coyote brush scrub. EBRPD would convert the coyote brush scrub to successional grassland. Oak-bay woodland, California annual grassland, and the small amount of riparian woodland in this project area would be preserved.

### **3.4.2.3.10 Lake Chabot Regional Park**

Lake Chabot Regional Park contains proposed project area LC010, a 4.8-acre area adjacent to residences on Hillsborough Drive in Castro Valley. All but 0.23 acres of this project area is oak-bay woodland and California annual grassland. The remaining 0.23 acres is coyote brush scrub. EBRPD would convert most of the coyote brush scrub to successional grassland.

### **3.4.2.3.11 Miller/Knox Regional Shoreline**

Five proposed project areas totaling 22.2 acres are in Miller/Knox Regional Shoreline. The project areas are in the northern and southeastern sections of the park near residences in both areas. The most abundant types of vegetation are coastal scrub and pine forest. EBRPD would convert most of the coastal scrub, about half of the pine forest, and a smaller amount of eucalyptus forest to successional grassland. California annual grassland in project areas MK001 and MK003 and a small area of riparian woodland in project area MK004 would be preserved.

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